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LADY SUFFOLK.

A DISSERTATION ON HORSE BREEDING, AND ON THE TROTTING HORSE OF THE U. STATES.

Ah! What is this we have here? says the staid and sober farmer, as, on coming in from his daily round, he puts aside his sombrero, and takes up the Farmers' Library, to beguile the time, while the thrifty housewife is spreading his frugal repast. What do I see? *Lady Suffolk!* the cynosure of all observers; the very pink and *Fashion* of the day on every Trotting Theatre! And is it then a part of the design of a work which is offered for our instruction and amusement, to encourage and illustrate such diversions? No! good reader, not at all! There is, says the good book itself, a time for all things, as there is a place for all things; and *the* place for all field amusements, in our country, is the "Spirit of the Times." Far from wishing to poach on the manor of our friend Porter much rather would we assist in stocking it with choice game—but who besides Neptune can wield his own Trident! Who but himself, wear the armor of Achilles! and besides, as we well remember, he did once come very near taking the wind out of our sails, whereupon we surrendered to his management and direction, the whole field of rural sports, and have ever since most heartily wished that his success might only equal his *spirit*,—may he never be at a loss for the where, and the wherewithal, to wet his line and his—whistle; and may he never throw fly, without hooking a trout.

No, gentle, sedate, and courteous reader; we have been at some trouble and expense to procure and offer you a portraiture of Lady Suffolk, for the sake of presenting to the eye of the practical farmer, as well as the amateur of horse flesh, who may or may not be horse breeders, the true form and points, as nearly as the arts at our command would enable us; of an animal the most distinguished in that form of action, *the trot*, which of all equestrian paces deserves to be regarded as the *most useful* in the business of life; unless it be, what he "of Roanoke" denominated, the "long slouching walk of the blood horse in the plow."

Although, as may be seen in our edition of "Youatt and Skinner on the Horse," published by Lea & Blanchard of Philadelphia, we had given accounts of many of Lady Suffolk's most distinguished feats, we had never had the pleasure to see her until to-day, nor, that we remember, had we inquired particularly, certainly not successfully, into her genealogy. But seeing how she had gone, both the pace and the distance, we never doubted, that whenever it should be traced, it would be found to be of high aristocratic blood. Hence, when we came now, as in duty bound, to look into her lineage, it occasioned not the least surprise to find it tracing through more than one stream, directly to the fountain of so much that is superexcellent in *horseology*—to wit: to the loins of *old Messenger himself!* In truth, when we reflected on her birthplace—Long-Island—and came to see her veins so well defined—her apparently hard bone—her large, open jaws—prodigious muscular development, and yet more, her grey color, and the way she carries her age, we should have been disappointed not to find at her heart something of the same strain of blood that conferred similar power on her near relatives, *Mambrino* and *Abdalla*—son and grandson of Messenger—*trotters and the getters of trotters.*

According to the best information we have been able to get, Lady Suffolk was by Engineer, a grey horse, he out of a mare whose

pedigree is not remembered, but "was understood to be a blooded mare"—Engineer was by Engineer, said to be an uncommonly fine horse, and by *Messenger*. Lady Suffolk's dam, was a dark bay or brown mare, by *Don Quixote*, a grey horse, and he again by Messenger. Lady Suffolk was bought (when four years old, and when she was yet barefooted and hardly bridle-wise, having never then looked through a collar) by David Bryan, Esq, of Brooklyn, her present owner, who, "though laughed at by some, *thought he saw something about her that pleased him.*" She made her first appearance about 14 months after he bought her, on the Beacon Course. She has trotted many more than fifty matches, appearing at different times at Baltimore, Philadelphia, New-York and Boston; winning much oftener than she has lost, and making the quickest time on record: doing her mile on three different occasions, under the saddle, in 2m. 26¼s. On the Centreville Course, she trotted one mile, in a two mile match, in 2m. 30s., in harness. She was beaten but once last season, and only once again this season. and that only by a neck. At Hyde Park, Philadelphia, she trotted matched in harness along-side of Ripley, two miles in 5 minutes 19 seconds, distancing Hardware and Apology.

Her owner has taken no measures to test, accurately, the time in which she *can* go her mile, under the saddle; but would gladly match her for any reasonable amount, against her greatest, and the quickest time on record—2m. 26¼s. He thinks, and we do not doubt, that Lady Suffolk is still, like the whole world, *in a state of progress*, and has not yet reached her highest point of capability.

Like all well-bred dames, she is remarkably quiet and gentle; nothing fussy, impatient, or ill-tempered about her. Any old woman might drive her to market, where she might remain in a wagon unnoticed, except by a man who *had an eye for a good thing.*

It is worthy of note, to show how accident rules the destiny of horses as well as men; that her sire was for a long time neglected, being put off, for the most part, with ordinary, unsightly mares, and the way that he was at last reclaimed, and brought into full relief, was thus: Doctor Bowers, being often sent for, as country physicians are, on certain pressing emergencies, that won't stay for any man's convenience, to go in a great hurry, especially to his female patients, several times observed that the messengers sent for him, rode horses of uncommon power and action; and inquiring into their history, was uniformly answered that they were by *Engineer*; a horse with which he had been familiar, and that had been denied the tip-top mares where he stood, so that his owner had sold him off to distant parts, in disgust, at his being underrated. On seeing thus the marks he had left behind, the Doctor had the sagacity to go or send in search of him, and tracing him through Connecticut and Rhode-Island, found him stowed away in some odd corner in Massachusetts; and for a trifle recovered him and brought him back again, to enjoy better opportunities of transmitting his superior qualities, such as are embodied in Lady Suffolk, and a half sister, standing now in the next stall to her, at Brooklyn—a flea-bitten grey mare, of the same age, who, though badly spavined, moves with great speed and power, and exhibits, in like manner, the remarkable points that distinguish the Messenger stock; such as may be, even down to the present generation, at once detected by quick-sighted connoisseurs of good cattle.

$5,000 have been repeatedly refused for Lady Suffolk, and the probability is, that like other distinguished performers, she may go to act in Europe on a theatre, larger, and more remunerating than is to be found in this Democracy.

The point that impressed us most forcibly, at the first glance, as most striking in the *physique* of Lady Suffolk was, as before stated, her wonderful muscular display, over the shoulder and arm—thigh and leg proper—her strong loin and good share of bone,—all indicating great strength.

Professor Cline, of London, one of the most esteemed writers on the art of breeding, and on the form of animals, remarks, that "muscles and tendons, which are their appendages, should be large; by which an animal is enabled to travel with greater facility." "The strength of an animal," he adds, "does not depend on the size of the bones, but on that of the muscles; many animals with large bones are weak, their *muscles being small.*"

In our country we are well satisfied, and it is probably true as to others, the improvement of domestic animals, has been much retarded, by the vulgar persuasion, that the *largest males* should be selected, for the purpose of procreation; a most pernicious error! This fallacy is the source of the mortification experienced by many farmers, who select from their herd or their flock, or in purchasing give the largest price for overgrown bulls and rams, without respect to form or family, or excellence in particular points; and too often give the preference to stallions blazoned in their handbills, for being "full sixteen hands and upwards under the standard." It was not thus that the Collingses improved the short horns, or Ellman the Southdowns, or that the general stock of English horses, has been brought to its admitted excellence. This has been accomplished by successive, and in most cases judicious crosses, having frequent recourse, when building up their pre-

sent superior stock, to foreign crosses. Most frequently to *Barbs*, (as the Godolphin,) which is known to be a race of comparatively small horses, with thin skin, fine hard bone, and a great share of muscle.

Many are at a loss to account for the fact, that English horses have not been benefited by recent crosses with Arabian stallions, but to us it seems apparent, that the reason why the *Darley Arabian*, and after him the yet more celebrated *Barb*, Godolphin, contributed more decidedly than any Arabians have done since, to the improvement of their stock, is, that they were imported at the very juncture when the English stock was in a condition to need a cross, that should impart more muscle and harder bone, with better wind; while it should diminish the size and weight of the carcass, which had been made too heavy and inert, by repeated recourse to *Flemish and German blood*. On this point Professor Cline is quite explicit: "the great improvement of the breed of horses in England, arose from crossing with those *diminutive* stallions, Barbs and Arabians; and the introduction of Flanders Mares into this country was the source of improvement in the breed of cart horses: when it became the fashion in London to drive large bay horses, the farmers in Yorkshire put their mares to much larger stallions than usual, and thus did infinite mischief to their breed, by producing a race of small chested, long-legged, large-boned, worthless animals."

The ill effects here described by the distinguished Professor, was the result in our own country, of a large "Cleveland bay" stallion, imported by the late Robert Pattison of Maryland, and sent into Frederick county of that State. His younger brother, a gentleman of fortune by inheritance, but a farmer by choice, and of uncommon sagacity and judgment, would have foreseen the result of such a cross. Nowhere so systematically as on his estate, have we ever seen so fully carried out and completely illustrated, this important principle in breeding as already quoted from Professor Cline, that "to produce the most perfect formed animal, abundant nourishment is necessary from the earliest period of its existence until its growth is complete." So thoroughly is Mr. P. impressed, too, with the expediency of getting *as much blood* as you can into the horse of all work, consistently with the weight which is indispensable for slow and heavy draught, that he seeks to have as much of it as can be thrown into his *plow and wagon horses*. Were the question doubtful, the argument must preponderate which is supported by the practice and exporience of an agriculturist, rare in all countries, who is ready with his reason for every thing he does, and "no mistake at that."

Having accomplished their purposes by enlarging the lungs, and improving the conformation of their species, giving more muscle in proportion to the mass of flesh to be carried, the same stallions, from Arabia and Barbary, could they rise Phœnix-like from their ashes, could, probably, not now be employed with the same beneficial effect in England.

English writers, and among them Mr. Aperly, (Nimrod,) one of the most voluminous and accomplished, on field sports, admits the superiority of the American *Trotter*, and as that is perhaps the only sort of animal, or department, in which we can lay claim to excellence over John Bull, in any of the properties which give value to domestic animals; and as, moreover, *speed in that gait, combined with lastingness*, is a desideratum in horses destined as well for public and private coaches, as for all kinds of light harness, and quick traveling, it becomes an interesting inquiry, both to amateurs of the Horse, and to practical farmers,—*whence has resulted the superiority asserted for, and conceded to the American Trotting Horse?* Is it that we possess a particular strain of horses not to be found in other countries, not *thorough-bred*, but yet of a specific breed, which has been found or made in America, and which may be kept separate and distinct from all others, the root whereof is not necessarily to be looked for, like that of our thorough-bred stock, in the *English Stud-Book*, or in the blood of some Eastern ancestor—a breed to which, in a word, recourse may be had as a stock of horses *sui generis*, and one that may be relied upon to supply fast goers in this pace? Or is it that we owe the number that can go their mile under 2.40, to the higher estimate which is placed on excellence in that way, in this country; and to the greater pains taken and skill exercised in educating and training horses to go ahead in the trot? We confess that reflection and all the lights we possess, lead us to the adoption of this latter theory.

There are various reasons why this property in the horse should be more attended to in this, than perhaps any other country. May it not be referred in some measure, to our political institutions, as we have already seen, in the view which has been taken [in Skinner and Youatt on the horse] of the progressive improvement of horses in England, how their qualities have, from time to time, been influenced and modified by their field-sports, the state of their roads, the form of their coaches, and changes in their warlike and agricultural habits and implements? Under the effect of our political institutions, which create frequent division of estates, it is next to impossible that there should exist in America a *class* of men with sufficient and enduring wealth, either hereditary or acquired, to maintain the costly and magnificent arrange-

ments for the sports of the turf and the chase—such as have for centuries existed in England. Yet men must have amusements, and those which are found a-field are at once the most attractive and salutary.

It may be very safely affirmed, that while there can exist in this country no permanent class of men possessing the wealth which affords the time, and cherishes the taste, for the more expensive diversions of the Turf and the Chase; it must yet always abound far beyond all other countries, under their existing governments, in citizens of middling and yet easy circumstances, with means enough to indulge in other sports involving *moderate outlay*, including the ownership of a good old squirrel gun; and the luxury of a *good horse*; and hence the use of both is as familiar to the great mass of American people, from their childhood, as it is strange to the common people of any other country; except as to the employment of the horse, in his lowest offices of field-labor and common drudgery. No Southern boy, at least, just entering his teens, desires better fun than to be allowed to catch and mount any horse in the most distant pasture, and ride him home at the top of his speed, without saddle or bridle—and as to the use of fire-arms, it was remarked to the writer during the Late War with England, both by General Ross and Admiral Cockburn, that in no country had they ever witnessed any fire so deadly as that of the American militia, *as long as they would stand!* In the towns, there is not a sober and industrious tradesman who cannot manage to keep his hackney; and these considerations sufficiently account for the number of regularly constituted Trotting Clubs of easy access, with courses that serve as so many nurseries, where the horse is educated exclusively for *the trot*, and his highest physical capacities drawn out in that form. These associations are composed, for the most part, of respectable and independent mechanics, and others, especially *victualers*, among whom in all times there has existed a sort of *esprit de corps*, or monomania on this subject, which leads them to spare neither pains nor expense to gain a reputation for owning a crack goer. This sort of emulation so infects the class, as to have given rise to a common saying that "*a butcher always rides a trotter.*"

According to the theory here maintained, the great *number* of trotters in America that can go as before said, their mile under 3 minutes, and the many that do it under 2m. 40s., and even in some cases under 2m. 30s.—as, for instance, in the case of Ripton and Confidence, whose performances have given so much gratification to sportsmen, is to be explained in the same way that we account for the *great number of superb hunters* that are admitted to abound in England above all countries, not excepting our own.—There, in every county in the Kingdom, there are organized "*Hunts*," with their whippers-in, and huntsmen, and earth-stoppers, and costly appointments of every kind to accommodate some fifty or a hundred couple of high-bred hounds, whose pedigrees are as well preserved as those of Priam or Longwaist; and a wide district of country is reserved and assigned exclusively to each hunt. Fox-hunting is there termed, *par excellence*, a princely amusement; and gentlemen of the most exalted rank and largest fortune take pride in the office of "*Master of the hounds;*" and assuredly, in all the wide field of manly exercises, none can compare with an English fox or steeple-chase, for union of athletic vigor and daring skill, and magnificence of equitation; unless, perhaps, it were some splendid *charge de cavalrie*, like those we used to read of, made by the gallant MURAT at a critical moment of the battle, when he was wont, in his gorgeous uniform and towering plumes, to fall with his cavalry like an avalanche upon his adversary, confounding and crushing him at a blow! Truly, it would well be worth a trip across the Atlantic, to see a single "turn out" of an English hunt, all in their fair tops, buckskin smalls, and scarlet coats—mounted on hunters that under Tattersall's hammer would command from one to two hundred guineas! Imagine such a field, with thirty couple of staunch hounds, heads up and sterns down, all in full cry, and well away with their fox!!

> "Now, my brave youths,
> Flourish the whip, nor spare the galling spur;
> But, in the madness of delight, forget
> Your fears. Far o'er the rocky hills we range,
> And dangerous our course; but in the brave
> True courage never fails."

To indicate more strongly the prevalence of this partiality for trotting-horses, and emulation to own the fastest goer, and the number and extent of associations and arrangements for this sort of trial and amusement, it need only be mentioned that the "New-York Spirit of the Times" contains lists of hundreds of matches and purses, and of thousands on thousands of dollars in small purses, won and lost on these performances on *trotting-courses!* A number of these performances might be given, enough to show that the excellence which is conceded to American trotters is not founded on a solitary achievement or very rare cases, nor to be ascribed to the possession of any distinct and peculiar breed of horses; but is the natural and common fruit of that union of blood and bone, which forms proverbially the *desideratum* in a good hunter, and of which Lady Suffolk presents a remarkable specimen, with the superaddition of *skillful training, much practice*, and *artful jockeying* for the trotting course. Who can doubt that if Hiram Woodruff were to go

to England, having the run of their hunting-stables, he might select nags enough which could soon be made, under his training and consummate jockeyship, to go along with Edwin Forrest and Lady Suffolk, Ripton, Rattler, Americus, and the Dutchman? On this point the following may be aptly extracted from the highest authority—*our* Bell's Life in London—to wit: Porter's Spirit of the Times:

"Nimrod, in 'admitting the superiority of our Trotting-Horses to the English,' claims that the English approach *very near* to the Americans,' even in this breed of cattle. But there is no comparison whatever between the Trotting-Horses of the two countries. Mr. Wheelan, who took *Rattler* to England last season, and doubly distanced with ease every horse that ventured to start against him, as *the record* shows, informs us that there are twenty or more roadsters in common use in this city, that could compete successfully with the fastest trotters on the English Turf. They neither understand the art of training, driving or riding, there. For example: some few years since, *Alexander* was purchased by Messrs. C. & B. of this city, for a friend or acquaintance in England. Alexander was a well-known roadster here, and was purchased to order, at a low rate. The horse was sent out and trials made of him; but so unsuccessful were they, that the English importers considered him an imposition. Thus the matter stood for a year or more. When Wheelan arrived in England, he recognised the horse, and learned the particulars of his purchase and subsequent trials there. By his advice the horse was nominated in a Stake at Manchester (we believe) with four or five of the best trotters in England, he (Wheelan) engaging to train and ride him. When the horses came upon the ground, the odds were 4 and 5 to 1 against Alexander, who won by nearly a *quarter of a mile!* Wheelan says he took the track at starting, and widened the gap at his ease—that near the finish, being surprised that no horse was anywhere near him, as his own had not yet made a stroke, he got frightened, thinking some one might outbrush him—that he put Alexander up to his work, and finally won by an immense way—no horse, literally, getting to the head of the quarter stretch, as he came out at the winning stand! The importers of Alexander, at any rate, were so surprised and delighted at his performance, that they presented Wheelan with a magnificent gold timing-watch, and other valuable presents, and sent Messrs. C. & B. a superb service of plate, which may be seen at any time at their establishment in Maiden-Lane."

Here it is clearly shown that the comparative speed of American horses is to be attributed not to *breed*, but to *management*, on which we the rather insist, as it is to be desired that American agriculturists, and all breeders and trainers of horses, should understand and practice upon some fixed and rational principles, rather than rely for success on some imaginary strain of horses, of no certain origin or established blood. After all, we have accounts of performances in trotting, by English horses, that may be considered as extraordinary as those of our own, when allowance is made for the greater value placed, and the more attention and skill bestowed, upon trotters in this country than in that.

The celebrated English trotter Archer, descended from old Shields, a remarkably strong horse and master of fifteen stone, (two hundred and ten pounds,) trotted his sixteen miles, in a very severe frost, in less than fifty-five minutes. In 1791, a brown mare trotted in England, on the Essex road, sixteen miles in fifty-eight minutes and some seconds, being then 18 years old; and, while we are writing, we learn from an official report that Lady Hampton, on the 2d of May, 1842, in England, trotted seventeen miles in 58m. 37s. in harness. She was driven by Burke, of great English trotting celebrity. On the 13th of October, 1799, a trotting match was decided over Sunbury Common between Mr. Dixon's brown gelding and Mr. Bishop's grey gelding, carrying twelve stone (one hundred and sixty-eight pounds) each, which was won by the former in twenty-seven minutes and ten seconds. A Mr. Stevens made a bet which was decided 5th October, 1796, that he would produce a pair of horses, his own property, that should trot in tandem from Windsor to Hampton Court, a distance of sixteen miles, within the hour; notwithstanding the cross country road, and great number of turnings, they performed it with ease in fifty-seven minutes and thirteen seconds. Phenomena trotted nineteen miles in an hour.—These examples are adduced to show the fallacy of that impression which would lead the public to look to any but the true and rational sources of superiority—for mankind has ever been prone to the marvelous, preferring to look for all that does not lie on the surface, to some mysterious influence, unconnected with known and rational causes. The trotter, according to the distance prescribed as the measure of his capacity, needs the combination of form and blood—of bone and of muscle, which give distinction to the hunter; and the reason, if it be asked, why the *thorough-bred* cannot be relied upon for a hard run over a rough country, is, that he rarely *combines* these requisites, and is, moreover, put to his work when *too young*; but does any one doubt that Sir Archy, or Timoleon, or Eclipse, or imported Tranby, or Leviathan, would have made first-rate *hunters* or *trotters*, if, before they were put to hard work, their frames had been left to ripen, and their bones and joints and muscles to get firm and solid, and at the same time pliant and supple, by gentle and moderately increasing exercise until five or six years old—for here it is to be noted that, as to the *age at which the trotter should be put in training*, and that at which he reaches his maximum of power, though there would seem to be some difference of opinion, all agree that the trotter is not in his prime

until he is eight or nine years old. The Abdallahs, great-grandsons of old Messenger, trot much younger; Hiram Woodruff—and there can be no better authority—would *commence* a horse's training for the trot at five or six years of age, giving him light work, however, but going on increasing his work from year to year, and expecting increasing excellence up to nine or ten years, and with kind usage he might continue up to this mark for three or four years longer, and they often last to perform admirably until after twenty—for example: *Columbus, Paul Pry, Topgallant,* &c.

The stoutest horses, of whatever kind or degree of blood, might be expected to give way if put at three or four, as the race-horse is, into severe training under heavy weights, for trotting-stakes or the chase; but on the other hand, without blood to give him wind and courage, what would avail his "bag of bones," in a trial to trot his hundred miles in ten hours? Johnson, author of the Sportsman's Cyclopedia—justly esteemed high authority on such subjects—remarks that "thorough-bred horses, and particularly those of the best blood, are seldom possessed of sufficient bone to render them preeminently calculated for the chase; yet I am free to confess that the very best hunters that have fallen under my observation have been *remarkably well and very highly bred*, but yet not absolutely thorough-bred." The same remark, it is not doubted, might be made as generally applicable to our first-rate trotters, at long distances. The case of Abdallah and Messenger has been instanced to show that great trotters, not thorough-bred, may and do *beget* trotters; and hence some would argue that a distinct race of horses may or does exist. But it is to be remembered that both Abdallah and Messenger are sons of Mambrino, son of old Messenger, and of Messenger mares, though not thorough-bred; and nothing is better known by all who have been in the habit of attending to these subjects, than that the Messenger family is distinguished for making first-rate coach-horses—quick in light harness, and remarkable for endurance and long life. That Abdallah, therefore, himself deep in the Messenger blood, should be himself a trotter and a getter of trotters, only proves that like begets like; and that of a distinct breed, like the thorough-bred horse, characterized by the possession of general properties belonging only to and constituting that breed, there may be *particular families* distinguished for some peculiar qualities not possessed in the same degree by other families of the same breed. Thus we have the three classes of the English thorough-bred stock, to wit: the *Herod*, the *Matchem*, and the *Eclipse*, that have served as crosses for each other. In like manner, it may be said of the improved short-horn cattle—their general characteristic is early maturity and propensity to fat, without being generally remarkable as deep milkers, though there are *families* of the short-horns esteemed for *that* quality. A dash of the blood of old Messenger imparts high form and action for the State coach, and the eye of the connoisseur can detect the signs in a horse in whose veins flow even one-eighth of his blood; so the fact is generally known to old gentlemen in the South, and especially avouched by the Sporting and Agricultural Society in South Carolina, that the stock of old Janus (there called Genius) was so remarkable as *road and saddle horses*, as to have gotten to be considered a distinct breed; so the Topgallant stock made fine saddle-horses, excelling in the canter. The blood horse, too, is remarkable for longevity—the Messenger stock particularly so. If the truth could be known, it is probable it flowed in larger or smaller streams in each of the four thorough-breds which the late General Hampton (sire of that paragon of sportsmen and gentlemen, Col. Wade Hampton) drove in his coach all together for sixteen years.

While it has been found impracticable to obtain any precise information as to the pedigree of some of our very best trotters, in other cases where more is known, they are found to be deep in the blood.—Awful, whose performances will be seen in the tables annexed, is known to have been gotten by a thorough-bred "American boy." Abdallah, as before mentioned, is by Mambrino, and he again, a great trotter, by Messenger; but *Dutchman*, one of our best trotters, has no known pedigree, though we have some reason to think he was by Young Oscar, then at Carlisle. He was taken out of a clay-yard, and was transferred to the trotting-turf from a Pennsylvania wagon-team. Woodruff thinks blood does not give them *length*, or the power to go the long distances; but in this it is believed he must be mistaken. These Canadian or Norman-French stallions, small and compact, which on well-formed, large mares give such fine harness-horses and trotters, are, as before said, deeply imbued with the blood of the barb taken from Spain into Normandy. We have been told lately by an intelligent Englishman, that the infusion of blood into their coach-horses has enabled them to lengthen their stages, and in very observable proportion to the degree of blood. Finally, as where the blood of the trotter when known, is seen to flow in so many instances from a spring of pure blood, is it not fair to infer a *similar* origin in cases where the blood cannot be traced? especially as the universal experience of all times proves that in other paces, the cases have been *extremely rare*, in which a horse of impure blood has been known to *keep up a great flight of speed?* A

horse of *mixed* blood may be a great trotter at a long distance, because his speed at his best is greatly behind that of the best speed on the turf; but it would, according to all principles of reasoning, be unreasonable to expect great excellence even as a trotter, in horses *altogether free* from the blood which gives foot and wind to the Eastern courser. Though we may not be able to trace it, and though in solitary cases a horse without it,may possess great speed and lastingness in the trot, from excellent accidental conformation, we repeat that the possession of the two warrants the presumption of the third, however obscure the traces, or remote the origin;—*this is our theory!* But the action to be cultivated in the racer and the trotter is of itself sufficient to explain why a racer should not succeed at once on the turf and on the trotting-course. All reflecting and observant men will admit that "as there is no royal way to mathematics," so there is but one way for a horse to excel in his business; and with rare exceptions there is but one in which any individual horse can excel. Whatever that business may be, to be perfect in it he should be educated and kept to it—and to it only. *A trotting horse should do nothing but trot.*

The weight carried on the Northern Courses, where a majority of our trotting takes place, is 145 pounds, without any distinction for age or sex; and the same weight has to be carried by the driver, exclusive of the weights of his sulkey or match cart, as by the same jockey in the saddle. These match-carts are of the neatest construction, and weigh generally nearly ninety pounds, though they often weigh twenty pounds less, and there are one or two which weigh but fifty-three pounds! But the mere weight to be carried or drawn by a *trotter*, is much less regarded by the sportsman than in the case of the *race horse*. On the Hunting Park Course, near Philadelphia, the weight was formerly 147 pounds in the saddle, and in harness catch-weights, but they have now adopted the New-York scale. But in far the greater number of the cases below, unless the weight be expressly named, it may be presumed to be from 145 to 155 pounds. Hiram Woodruff weighs without his saddle 160 pounds. On the Beacon and Centreville Courses, pacers are allowed five pounds, and wagons, in distinction from sulkeys or match-carts, must weigh 250 pounds.

As a matter of course from the difference of weights carried along by him, the trotter generally makes better time under the saddle than in harness, though there are some exceptions to this rule. Another consideration has great influence upon this difference in time. Under the saddle, the jockey can hug the pole of our oval-shaped courses more closely than in harness, and thus he actually goes over less ground. And for an obvious reason the speed of a horse in going "round the turns" is more retarded in a sulkey than under the saddle. As before stated, no allowance of weights is made for age, and in consequence no note is taken of the age of trotters in official reports of their performances.

We have already intimated that in introducing Lady Suffolk to our readers, accompanied with this dissertation on *Trotting Horses*; our aim is, not to encourage a fondness for equestrian exhibitions of this character, merely as an amusement; but to indicate how excellence so desirable in this property of the horse, is only to be secured and cultivated, by attention to blood and good management of the breeding stud. With that object in view, and on the salutary principle of mixing the agreeable with the useful, it is deemed not amiss to entertain the reader, who may not have seen, or who may have forgotten them, with a few

MISCELLANEOUS EXAMPLES OF EXTRAORDINARY PERFORMANCES OF AMERICAN TROTTERS.

Topgallant, by Hambletonian, trotted in harness 12 miles in 38 minutes.—See Turf Register, vol. 1. p. 124.

Ten miles have been repeatedly trotted in America within two or three seconds of thirty minutes.

A roan mare called *Yankee Sal* trotted, as has been stated without contradiction, in a match against time, on the Course at Providence, R. I. which was at the time heavy and deep, fifteen miles and a half in 48m. 43s., a rate of speed so prodigious *under the circumstances*, that we have often suspected there may have been an error as to the time.

Lady Kate, a bay mare, 15 hands high, trotted on the Canton Course, near Baltimore, 16 miles in 56 m. 13s., and the reporter adds, "she could have done *seventeen with ease*."

In October, 1831, *Jerry* performed 17 miles on the Centreville Course, L. I. in 58 minutes under the saddle.

In September, 1839, *Tom Thumb*, an American horse, was driven in England 16¼ miles in 56m. 45s. We shall have more to say of this phenomenon, when we come to his performance of 100 miles.

In 1836, the grey gelding *Mount Holly* was backed at $1,000 to $500, to trot twenty miles within the hour. The attempt was made on the 10th of October, on the Hunting Park Course, Pa., but failed. He performed 17 miles in 53m. 18s. without the least distress. He was miserably jockeyed for the first five miles, doing no one of them in less than five minutes.

Pelham, a large bay gelding, in a match to go 16 miles within the hour, performed that distance without any training in 58m. 28s. He went in harness *seven* miles in 26m. 29s., when, the sulkey being badly constructed, he was taken out and saddled, and mounted by Wallace (riding 160lbs. without his saddle) and won his match.

Paul Pry, a bay gelding, was backed to perform 17¾ miles within the hour, under the saddle. On the 9th of November, 1833, on the Union Course, L. I., he won the match, performing 18 miles in 58m. 52s. Hiram Woodruff, weighing

then 138 lbs. jockeyed him. Paul Pry was nine years old, bred on Long Island, and got by Mount Holly, dam by Hambletonian.

In 1831, *Chancellor*, a grey gelding, ridden by a small boy, performed 32 miles on the Hunting Park Course, Pa., in 1 hour, 58m. 31s. The last mile, to save a bet, was trotted in 3m. 7s.

In October of the same year, George Woodruff drove *Whalebone*, on the same Course, the same distance in 1 hour, 58m. 5s. He commenced the match in a light sulkey, which broke down on the 14th mile, and was replaced by one much heavier. This Course is fifty feet more than a mile in the saddle track, and much more than that in the harness track.

On the 11th of September, 1839, Mr. McMann's bay mare, *Empress*, on the Beacon Course, in a match against time, $600 a side, performed in harness 33 miles in 1 hour, 58m. 55s.

The American horse *Rattler* was ridden by Mr. Osbaldistone in England, in a match against *Driver*, 34 miles in 2 hours, 18m. 56s.—Mr. Osbaldistone rode 125 lbs.; Rattler was 15¼ hands high.

In July, 1835, *Black Joke* was driven in a match against time, on the Course at Providence, R. I., 50 miles in 3 hours, 57s.

A grey roadster is reported to have performed the same distance on the Hunting Park Course, Pa., in 3 hours, 40m. It was a private match.

A grey mare, *Mischief*, by Mount Holly, out of a Messenger mare, 8 years old, in July, 1837, performed *about* 84½ miles in 8 hours, 30m. in harness, on the road from Jersey City to Philadelphia. The owner would not allow a whip to be used. The day was excessively warm, and the mare lost her match (to perform 90 miles in 10 hours) through the stupidity of a groom who dashed a pail of water over her with a view of cooling her.

Tom Thumb, before mentioned, performed on 2d February, 1829, on Sunbury Common, England, 100 miles in 10 hours, 7m. in harness. He was driven by William Haggerty (weighing over 140 lbs.) in a match-cart weighing 108 lbs. This performance, so extraordinary, demands more than a passing notice, and we accordingly abridge from an English paper the following deacription:

"Tom Thumb was brought from beyond the Missouri, and is reported to have been an Indian pony, caught wild and tamed. Others again allowing him to have been thus domesticated, think him to have been not the full-bred wild horse of the Western prairies, but to have had some cross of higher and purer blood. But too little is known of his breeding, saving his Western origin, to justify any satisfactory speculation.

"His hight was 14½ hands, and his appearance, when standing still, rough and uncouth. From his birth, he had never been shorn of a hair. He was an animal of remarkable hardihood, a hearty feeder, and though accustomed to rough usage, was free from vice, playful and good-tempered. He was eleven years old when he performed his match, and had never had a day's illness. At full speed his action was particularly beautiful—he threw his fore-legs well out, and brought up his quarters in good style; he trotted square, though rather wide behind, and low. He was driven without a bearing rein, which is going out of use in England, and simply with a snaffle-bit and martingale. He pulled extremely hard—his head being, in consequence, well up and close to his neck, and his mouth wide open. He did his work with great ease to himself, and at 11 miles the hour, seemed to be only playing, while horses accompanying labored hard.

"The whole time allowed for refreshments during his great performance, amounted to but 37 minutes, including taking out and putting to the cart, taking off and putting on the harness, feeding, rubbing down and stalling. The day before and the day after the match, he walked full twenty miles. His jockey provided himself with a whip, but made no use of it in driving him; a slight kick on the hind-quarters was quite sufficient to increase his speed when necessary."

In February, 1828, *a pair* of horses trotted against time 100 miles on the Jamaica turnpike, on Long Island, and won in 11 hours, 54m.

CENTREVILLE, L. I.

TUESDAY, May 10, 1842.....Purse $300. Two-mile heats, in harness.

D. Bryan's gr. m. *Lady Suffolk*.....Owner	1	1
H. Woodruff's br. g. *Ripton*.....	2	2

Time, 5.10—5.15.

Wonders will never cease—the grey mare has proved the better horse, and no mistake.—No longer ago than last Saturday, Ripton popt it to the mare and Confidence, over the Beacon Course, in the quick time of 5.10½—5.12½.

On the present occasion, Ripton was the favorite at 100 to 70. At the start they went off well together, at the top of their rate, making play from the score; on reaching the first turn, Ripton broke, and the mare took the lead by several lengths, going finely. Hiram made several efforts to make up his loss, but all was of no avail; the mare kept snugly to her work, and led throughout the heat, making the quick time of 5.10.

Second Heat.—They both cooled off well, and came up ripe for mischief. They got off well together at a flight of speed; Ripton broke, as usual, on the first turn, and lost several lengths, the mare taking the lead. Hiram got Ripton snugly to his work again, and caught the mare in the last quarter of the first mile, both coming down the straight side at a tremendous flight of speed; on making the turn, Ripton broke, and lost about fifty yards; and before the mare got out, Hiram made up his lost ground, lapt the mare coming down the quarter stretch, but was unable to win the heat, for Hiram had taken the kink out of his horse to make up the lost ground. Ripton was very restless, and broke several times during each heat.

HUNTING PARK COURSE.

On Tuesday last, a splendid trot came off over the Hunting Park Course, two-mile heats, between Ripton and Lady Suffolk, in which they made the best time on record at this distance, in harness. Hiram Woodruff on Ripton won the last heat by six inches only!

Hiram Woodruff's br. g. *Ripton*.....Owner	1	2	1
David Bryan's gr. m. *Lady Suffolk*.....	2	1	2

Time, 5.07—5.15—5.17.

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The following table has been made with care. It will be seen that while, in this list of about thirty great performers, not one is over 16 hands, only two are under 15.

USUAL HIGHT OF TROTTING-HORSES.

The annexed list gives the hight of many celebrated horses, *estimated* only, but by two most

experienced men, one of whom had groomed or ridden almost every one named, and the other is an old amateur, who has the quickest eye for a horse, and who rode *after* most of those named, and has seen them all repeatedly. Of the twenty-nine in the list, they differed only about eight, and of these only by one inch, save in a single case. In the eight cases we have given the estimate of the jockey who had ridden or driven them, and have great faith in its accuracy.

Names.	hands.	inches.
Dutchman	15	3½
Lady Suffolk	15	2
Columbus	16	1
Aaron Burr	15	1
Rattler (the latest)	15	2
Screwdriver (old)	16	0
Do. (latest)	15	0
D. D. Tompkins	15	0
Lady Warrington	15	1
Lady Victory	15	2
Topgallant	15	3
Sir Peter	15	2
Whalebone	15	3
Shakspeare	15	2
Betsy Baker	15	3
Cato	16	0
Edwin Forrest	15	0
Burster	15	0
Norman Leslie	15	3
Confidence (latest)	15	2
Locomotive	16	0
Sally Miller	15	3
Charlotte Temple	15	0
Washington	16	0
Modesty	14	2
Greenwich Maid	15	0
Awful	15	3
Henry	15	1
Paul Pry	16	0

TRAINING AND JOCKEYING THE TROTTER.

The acknowledged superiority of the performances of the American over English trotters, or, to speak with more precise accuracy, extraordinary performances in a greater number of cases, has been already attributed to superior skill in *training*; but on that we must not be understood as laying so much stress as upon *superior jockeyship* in this particular department; for *the training of the trotting horse*, so far as we can learn, requires no considerable skill, save as it is connected with the skill of the jockey, who usually acts in both capacities.—For training, the whole code is said to consist of three words—air, exercise, and food. The work given him in training is severe according to his constitution, and consists in walking him from twelve to twenty miles daily, and giving him "sharp work" three or four times a week. This "sharp work" is usually a distance of two miles, or sometimes three. The horse is not put to his speed this entire distance, but taught to rouse himself at intervals, at the call of his jockey, who encourages him and brings out his utmost capacity by *his voice*, not less scarcely than by the usual persuasion of whip and spur. This feature of trotting jockeyship is peculiar, and not a little amusing. The jockey is continually talking, or rather growling, to his horse, and at times he bursts out into shouts and yells, that would be terrific if not so ludicrous. The object would appear to be twofold—first, to encourage his horse to the utmost possible exertion of his powers when called upon; and, again, so to accustom him to this harsh shouting, that he may not break up when he hears it from the opposing jockey—for it is deemed not unsportsmanlike for one jockey to break up the pace of another's nag by thus actually frightening him. Many a victory has Hiram Woodruff won by thus rousing his own horse and breaking up his opponent's on the last quarter. These two mile drives are not repeated as is usual in training the race-horse. Nor is the work of the trotter given at intervals so regular as in the case of the other, nor is he kept in such habitual quiet; the trainer consults his own convenience to a great degree as to the time when he will give his nag exercise, and he never hesitates about taking him out and showing him at any hour.

In other respects, too, the treatment of the trotting-horse differs from that of the more high-bred racer. Less delicate in constitution and form, he is less delicately fed and groomed.—Allowed to eat when and what they please, trotting-horses are groomed with much the same care as well-kept town coach-horses, or perhaps the English hunter. In the two grand points of keeping them in robust health and giving them hard work enough, the training of the trotter and the racer is identical. But, for the trotter, from six to eight weeks' training is deemed sufficient. We are inclined to believe that very much of the superiority of the American trotter and roadster is attributable to the skill of the jockey. Our mode of driving them differs essentially from the English; and, though neither easy nor elegant it succeeds admirably in developing the capabilities of a horse at this pace. The case already cited of Wheelan and the horse Alexander, in England, is in point, and it is practically illustrated every day in New-York, many English residents of which city are trotting amateurs; they, one and all, after a little experience, adopt the Yankee mode of driving.

It has long been a question exciting much interest, whether twenty miles has been, or can be, trotted in one hour. There is no record of any such performance, although there have been many attempts to do it. But men of great judgment and long experience are so fully confident of the ability of our horses to go that distance at the required rate, that large odds would be laid that it can be done. The difficulty is to find an individual who will, at this day, back him to an adequate amount; for it will readily occur that a horse that can accomplish the feat must be of great value, and the risk of injury to

him is, of course, very considerable. It is believed that $10,000 to $5,000 would readily be laid that Dutchman can do it, and probably Americus would be backed at less odds likewise to do it. The trotting amateurs in New-York profess to entertain no doubt at all upon the subject, and it is believed they have sufficient reason for the opinion.

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In making the presence of Lady Suffolk the occasion for this long disquisition on the trotting horse, whose powers we have illustrated by examples of extraordinary performance, we have been influenced, let us repeat, by all the considerations which the strictest utilitarian can be supposed to regard. We are convinced that whenever we shall have entirely lost sight of the wonderful capabilities which are only to be found in the *bred* horse, the inevitable consequence must be *general deterioration*; while, with proper inducements and precautions to measure his foot and to guage his bottom, no such consequence need be apprehended. When we insist that, without a good portion of *blood*, we can reckon on no general or permanent supply of good nags for the saddle or the harness, possessing fleetness and endurance, our chief purpose is to impress upon American horse-breeders, generally, the absolute necessity of preserving that blood in its purity. A well-formed horse, of cold blood, may, it is true, occasionally get fine stock, especially on large, high-bred mares; but to abandon, therefore, our reliance on the blood of the Eastern courser, which has come down to us, intact, for ages, would be to let go the rudder at sea, because, perchance, the ship might be floated on an even keel into safe harbor. How the measure of excellence is to be applied, and the results to be recorded and preserved, we must not stop to discuss. Those who are opposed to all field-sports, on account of the dissipation and vice with which they are too often accompanied, might yet learn to tolerate what they cannot enjoy. Even Agricultural Fairs and Exhibitions are not always free from profane and immoral indulgences, though under the strictest regulations. In short, the whole business of life is mixed up with good and evil, and is full of compromises. Shall we forego the use of gunpowder, because that "villainous compound" sometimes charges the pistol of the duelist; or throw up, altogether, the use of steam, because human life is sometimes sacrificed by the careless use of it?

POLITICAL VALUE OF THE BRED HORSE.

But it is not only as a question of individual comfort, or of agricultural economy, that the advantages of a breed of superior horses are to be looked at. It is worthy, too, of the serious regard of the *Statesman*, in the higher and more important aspect it presents in a *military point of view*, and as thus connected with our national defences. In *cavalry*, perhaps more than in any other weapon, our locality must always give us an advantage over any invading force. An enemy cannot bring cavalry with him.—With something like a well-arranged system in breeding our horses, this advantage may be turned to great account in time of war. With the forecast that distinguished his military administration, Napoleon had the sagacity to establish *Haras*, or studs, in the several departments of France, where thorough-bred stallions were placed at the service of the common farmer, on terms which barely paid the expense of their keep. But to come nearer home—while every one at all familiar with the incidents of our own Revolution, knows how much was effected in the South by Lee's famous "Legion," few, comparatively, may be aware to what that celebrated corps chiefly owed its efficiency—and yet it is undeniable that in a great measure the *prevalence of blood in his horses* made it at once the scourge and the terror of the enemy. Wonderful in their endurance of hunger, thirst, and fatigue—prompt to strike a blow where it was least expected, and, when forced, as quick to retreat—they may be said to have well earned the description applied to the Parthian steed:

> "*Quot sine aqua Parthus nullia currat equus,*
> How many miles can run the Parthian horse,
> Nor quench his thirst in the fatiguing course!"

ARTIFICIAL MANURES.—The extent to which research has been carried to discover new fertilizers, and the universal conviction, in England, that only by the free use of manures can their lands be kept in heart, is well evinced in one of the excellent letters of Mr. Norton, (the 11th,) published in that most excellent journal the Albany "CULTIVATOR.'

"As Guano begins to fail, (says Mr. Norton,) they are bringing home the bodies of the birds themselves; some of them were lately sent here in order that their value as a manure compared with that of Guano, might be determined by Prof. Johnston. They had lain buried for years under the Guano, and in appearance resembled the smoked geese from the Shetland Islands, sold in the shops here. They are quite saturated with ammonia, and their large bones add much to their value. They would require chopping into small fragments before depositing in the soil, and in consideration of this serious drawback, Prof. Johnston considers them worth about £4 per ton, or nearly $20. Were it not for this difficulty, they would be worth as much as Guano itself."

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND consists of 6,933 members. They pay their Secretary two thousand dollars a year!

OBITUARY NOTICE OF GEN. T. M. FORMAN OF MARYLAND.

WITH A CURIOUS HISTORY, DERIVED FROM HIM, OF THE IMPORTATION OF THE CELEBRATED STALLION, LINDSEY'S ARABIAN.

THE brilliant exploits performed, in the Revolutionary War, by Lee's famous Legion, alluded to in the close of the preceding chapter, were ascribed at the time, in a great measure, to the *high breeding* of his cavalry horses, rendering that Legion, as already stated, at once "the terror and the scourge of the enemy."

The reader will not take it amiss that we should transfer to our columns the curious account of the importation of that renowned horse. This account was derived by the Editor, from the late General T. M. FORMAN, who was too good a judge of the virtues of a good horse, and when alive loved a good horse too well, to take it amiss that his name should be associated in the same obituary notice, with one so distinguished in equestrian annals. Gen. T. M. Forman was a Revolutionary compeer of such men as Howard and Smith and Guest and Stewart, and survived them all until very lately, respected as a fine specimen of the "time that tried men's souls." He was truly a gentleman of the old school. At the time of his decease, which occurred recently, he must have been more than four score years of age, and yet he continued, sedulously, to the last, not only to bud and graft choice fruit, but to plant the nuts and seeds of forest trees, and to embellish with exotic trees and shrubbery, his much-loved garden, at Rosemount, on the beautiful shores of the Sassafras.

A memoir, in illustration of his partiality for rural life, and his disposition to grace and embellish it with hospitality, literature, and floriculture, is due to his memory, and would be, we need hardly say, an acceptable offering to the pages of the FARMERS' LIBRARY.

LINDSEY'S ARABIAN.

ABOUT the year 1777 or '78, Gen. H. Lee, of the Cavalry, and his officers, had their attention drawn to some uncommonly fine Eastern horses employed in the public service—horses of such superior form and appearance, that the above officers were led to make much inquiry respecting their history; and this proved so extraordinary, that Captain Lindsey was sent to examine and make more particular inquiry respecting the fine cavalry, which had been so much admired, and with instructions, that if the sire answered the description given of him, the Captain was to purchase him, if to be sold

The Captain succeeded in purchasing the horse, who was taken to Virginia, where he covered at a high price and with considerable success.

It was not until this fine horse became old and feeble that the writer of these recollections rode thirty miles expressly to see him. He was a white horse, of the most perfect form and symmetry, rather above fifteen hands high, and although old and crippled, appeared to possess a high and gallant temper, which gave him a lofty and commanding carriage and appearance.

The history of this horse, as given to me during e Revolutionary war, by several respectable persons from Connecticut, at various times, is:—

"For some very important service, rendered by the Commander of a British frigate, to a son of the then Emperor of Morocco, the Emperor presented this horse (the most valuable of his stud) to the Captain, who shipped him on board the frigate, with the sanguine expectation of obtaining a great price for him, if safely landed in England. Either in obedience to orders, or from some other cause, the frigate called at one of the English *West-India* islands, where being obliged to remain some time, the Captain, in compassion to the horse, landed him for the purpose of exercise. No convenient securely enclosed place could be found but a large lumber yard, into which the horse was turned loose; but delighted and playful as a kitten, his liberty soon proved nearly fatal to him. He ascended one of the piles, from which and with it he fell, and broke three of his legs. At this time in the same harbor, the English Captain met with an old acquaintance from one of our now Eastern States. To him he offered the horse, as an animal of inestimable value could he be cured. The Eastern Captain gladly accepted the horse, and knowing he must be detained a considerable time in the Island before he could dispose of his assorted cargo, got the horse on board his vessel, secured him in slings, and very carefully set and bound up his broken legs. It matters not how long he remained in the harbor, or if quite cured before he arrived on our shore; but he did arrive, and he must certainly have covered several seasons, before he was noticed as first mentioned.

"When the writer of these remarks went to see the horse, his first attention was to examine his legs, respecting the reported fracture, and he was fully satisfied, not merely by *seeing* the lumps and inequalities on the three legs, but by actually *feeling* the irregularities and projections of broken bones.

"In Connecticut (I think) this horse was called Ranger; in Virginia (as it should be) he was called Lindsey's Arabian. He was the sire of Tulip and many good runners; to all his stock he gave great perfection of form; and his blood flows in the veins of some of the best horses of the present day. Make what use you please of this statement: I will stand corrected in my narrative, by any person who can produce better testimony respecting Lindsey's Arabian.

"Your obedient servant, F."

September 10, 1827.

TURNIP CULTURE IN ENGLAND.

THE NORTHUMBERLAND PLAN (CONSIDERED THE BEST IN ENGLAND) DESCRIBED.

THE introduction of *Turnip culture*, as a field crop, seems to have been a providential inspiration. It was introduced first, upon a large scale, from Flanders into Norfolk, about two centuries ago, and thence passed into the South of Scotland and the North of England, not until a century after, so dilatory are Farmers in adopting new objects and new processes, adapted to their purposes of life. In Norfolk, we are informed the cultivation of Turnips as winter food for stock, was for a long time confined to one or two individuals, and at last spread widely, and was much accelerated and improved, by adopting the *row, or drill system*, invented by that great benefactor of English Agriculture—JETHRO TULL. The broad cast system is still practiced in Flanders, and to a certain extent, yet prevails in England; though in both countries the laborers *hoe them out*, with a dexterity, which obviates in a great measure, the ill consequences of the broadcast system, as practised in this country —at least in our Southern States. There, however, Turnips form but an insignificant object of regard. Most farmers looking to them, as for centuries they did in England, only as a culinary vegetable; and for that purpose they *'cowpen'* a small piece of old land, and sow their Turnips so thick as to shade the ground, leaving them to their fate, often without even thinning and hoeing. Now, however, that every one is becoming sensible how indispensable it is to increase the quantity, and to improve the quality of his *home-made* manure, it may be expected that more attention will be given to this important crop—important as compared with other root or green crops, on account of the facility of raising, and of preserving it. It is admitted that Turnips in many parts of Europe, are at the foundation of all the best systems of farming, inasmuch as they supply the requisite manure, and at the same time *clean the land* for subsequent crops, by the numerous plowings and harrowings which are indispensable in Turnip culture—a thing very much overlooked by American farmers, who seem not to reflect, that every spear of grass, and every noxious weed, takes from the crops not only the food which it finds in the soil, but its full share of that which floats in the atmosphere. It is admitted that such has been the effect of the introduction of Turnips as a field crop, in England, that without it, she could not have stood up under the load of her national debt.

In the preparation of the ground, and the management of the crop, what is called the *Northumberland* plan is considered the best, and that has been briefly described in the manner that we shall presently see;—the objection that will be raised to it in our country, is the labor it requires; but much better would it be, in most cases, to restrict the labor at command, to one-fourth of the surface, to which it is usually applied, than to waste it as is done, over fields barren by exhaustion, and want of manure; and yet more so by the slovenly and imperfect manner in which they have been tilled.

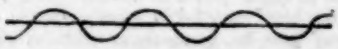
Persuaded that it is too late in the season to offer information which may be availed of now to any great extent, (although we have seen a heavy crop of common Turnips from a sowing on the 10th of September,) we proceed now to give—

THE NORTHUMBERLAND PLAN.

The County of Northumberland has been one of the foremost of the English counties in adopting the improved system of Agriculture—the chief feature of which is the cultivation of turnips for the rearing and fattening of cattle. Turnips accordingly occupy a large proportion of every farm, the soil of which admits of this cultivation. So great has been the advantage derived from this change from the old triennial system, that many fields now yield heavy crops of this useful root which in most other parts of England would be considered as totally unfit for its cultivation. This has arisen from the early adoption of the culture in rows on elevated ridges, which has received the general appellation of the Northumberland method, and which we shall therefore describe with some minuteness.

The ground having been prepared by as many plowings and harrowings as may be thought requisite to pulverize it and destroy the weeds, and laid quite flat, an experienced plowman draws as straight a furrow as possible, and, returning, lays the next furrow slice upon the first, thus completing what is usually called a *bout*. The usual width of the furrow being 9 inches, the first ridge and furrow take up 18 inches; the next furrow slice being laid over the first, the whole work takes a width of 27 inches. He then enters again at the distance of 27 inches from the land side of the first-made furrow, and completes a second bout parallel to the first. When the whole field is thus laid into narrow ridges, which, from the soil being light and crumbling, gives the section of the

surface a waved appearance, such as is represented in the annexed cut, the depressions are



about 6 inches below the former surface, and the ridges as much above. This at once doubles the depth of the cultivated soil in the ridges.—The manure is now brought on the land in small one-horse carts, the wheels of which are about 54 inches apart, so that the horse walks in one furrow while the wheels move in the two adjoining. The manure, which is chiefly common farm-yard dung, not too much decomposed, especially if the soil is inclined to clay, is laid in small heaps, drawn out of the cart by a dung-hook, or, which is better, by a boy standing on the load in the cart, who forks it out more regularly as the horse goes slowly on. It is then laid equally in the furrows by women and boys.—The quantity thus laid on depends on the supply of the yard compared with the breadth of turnips intended to be sown, for the whole is expended on this crop. In general, not less than 15 or 20 single-horse loads per acre are thought necessary to produce a good crop.—Twice that quantity is often put on. This dung is evenly distributed in the furrows to the right and left of that in which it has been deposited from the cart. The plowman now begins to cover this dung by splitting the ridges in two, laying one half to the left and the other to the right, and reversing the bouts, so that the ridges are now directly over the dung, which is completely buried. The appearance of the field after this is exactly similar to what it was after the first bouting. A roller is now drawn over the ridges, to flatten them at the top, in order that they may better receive the seed, which is drilled exactly on the middle of the ridge by a machine attached to the frame of the roller and dragged after it. The roller is usually sufficiently large to roll two ridges at once; and, in that case, two drilling-machines, each guided by a man, are fixed to it, and one horse, walking in the middle furrow, draws the whole apparatus forward. Thus, two men and a horse, with a boy to lead the latter, can drill four or five acres in one summer's day. The drill barrow has a very slight coulter, hollowed out at the back part to receive the tin tube through which the seed is delivered. The simplest construction of that part which distributes the seed is a tin cylinder, or, rather, double cone, with holes in the circumference, through which the seed falls into the tube. The seed-box revolves on an axis, turned by means of a connection with the axis of one of the wheels of the machine, which revolves with it; the other wheel turns round this axis. As long as the first-mentioned wheel goes on the ground, the seed is delivered; but as soon as it is raised, so that the drill proceeds on the other wheel alone, no seed falls through, because the axis no longer turns. Thus none is lost in turning at the ends of the ridges. In very light soils another slight rolling is necessary to press in the seed; but, in stiffer loams, a small chain or piece of iron, dragged after the coulter, is sufficient to cover the seed without rolling.—By this method the seed has not only a greater depth of mellow soil to strike in, but the fermentation of the dung immediately under it acts as a hot-bed, and soon brings it up; by which means it generally is so rapidly in the rough leaf that it seldom suffers from the depredations of the fly. Experience shows that in a moist climate the ridge system produces much more certain and heavier crops than could be expected in general from the most careful broad-cast culture. As soon as the turnip has four leaves out of the ground, the rows may be thinned by the hand or by the hoe, and the plants may be left from eight to ten inches apart. The next process is stirring the ground between the rows with a light one-horse plow. This plow takes a small shallow furrow to the left of the row, within three or four inches of the young plants, and lays it in the middle of the interval between the ridges. When this has been done on both sides all over the field, there will be small ridges formed between the principal ridges on which the turnips grow. All weeds are thus buried, except between the plants in the rows, where they are taken out by the hand or hoe. Some time afterwards, a narrow cultivator, like harrows with crooked tines, which are called *cats' claws*, from their shape, is drawn over the last-made ridge, to pulverize the earth and clear it from all remaining weeds; this is repeated more than once, if it should be thought necessary. Before the Autumn rains set in, or the turnips have too wide spreading tops, a plow with a double mould-board is drawn along the middle of the intervals, and lays half of the pulverized soil on each side against the ridge on which the turnips grow; not to cover the roots and protect them from frost, as some think, but to supply fresh mellow earth for the extending fibres of the root to strike into. In heavy, wet loams, it may be necessary, in order to make a clean, neat furrow between the rows, to let off any surface water, in the latter end of the season, with a double mould-board plow, and dig out deeper water-furrows with the spade across the ridges, where they may be required by the nature of the surface. But this is not often necessary in common turnip soils. By following the above system, Swedish turnips, and even common white turnips, may be raised with success on the heaviest soils; and if taken up early, and stored for winter use, they will leave the land in as good a state for wheat, with one or two plowings, as if it had been fallowed. The carts which take off the turnips will not hurt the land, for the horse walks in a deep furrow, and the wheels move in similar ones, and thus the mellow earth is not trod upon. In order that the dung, which is not yet fully decomposed, may be spread evenly for the next crop, the ridges are often made in a diagonal line across the usual line of plowing. When the turnips are off, one bout of the plow levels each of the ridges, heavy harrows level the whole, and it can be plowed in proper stitches for the sowing of the next crop. Sometimes what is sown immediately, but more frequently barley with clover-seed in spring. In the latter case the Swedish turnips may be left on the ground all winter, and taken up or fed off early in spring.

Though you may traverse the whole of Northumberland without meeting with a single field of turnips sown broad-cast, the drilling of other crops is by no means so common as in Norfolk and Suffolk, where most of the turnips, on the other hand, are still sown broad-cast. The expense of the machines for drilling corn may be one cause of this, but it seems not sufficient to account for it.

It is well known to all good farmers that all the subsequent crops depend on the success of the turnips. These are the source from which manure is provided, and no crop will keep so

much cattle during winter and early spring, with so little exhaustion of soil, as turnips. The manure abundantly put on the land to raise the turnips is a fund laid out at great interest for the benefit of the future crops; for the whole course is benefited by them, especially if they are fed off by folding sheep on them. Whether wheat or barley is sown after turnips, clover and grass-seeds are usually sown amongst it. The land being clean and in good heart, the grasses grow thickly and cover the ground well the year after. In the heavier loams, after the grasses have been once mown for hay, the land is depastured for two or three years, and then it is plowed once and sown with oats. After oats come beans, with some manure, and wheat ends the rotation. This is considered the best course for keeping the land in a state of progressive improvement. On very rich soils another crop of beans or peas may be taken after the wheat, and then wheat or oats again. Few soils, however, except the richest and deepest, will bear this exhausting course; and it is more prudent in general to return to the turnips after the first crop of wheat.

On light gravelly soils, where the clover and grasses soon fall off, the Norfolk system answers best. The turnips are fed off with sheep, or, where the crop is heavy, half the turnips are drawn for oxen and cows and the other half fed off; or, which is a late improvement, they are cut into slices or strips by a machine, and given to the sheep with cut clover hay in shallow troughs on the ground from which turnips were drawn. In this way the turnips go much farther; and the lambs and old ewes will thrive and fatten on them, which they could not have done in the old way for want of teeth to bite them. After turnips come barley and broad clover, with a small portion of annual rye-grass, mown once for hay and plowed up for wheat. The next course is the same, with the variation of some substitute for the broad clover which should not be sown on the same land oftener than once in eight years to ensure good crops. Part of the land may be in peas or tares to cut green, and part in grass-seeds without clover, according to the judgment of the farmer. There are some very heavy and wet soils in the county, which will not readily bear turnips, and where the sheep cannot be folded in winter, nor the turnips carted off without greatly injuring the land. There a fallow is unavoidable at least once in six or seven years. In other respects they are cultivated in a similar manner with good loams. The practice of thorough-draining, which is spreading rapidly, will probably soon banish clean fallows, and substitute turnips in their place, even in the most retentive soils, which will in time be converted into rich loams by the effect of cultivation, loaming, manuring, &c., as may be seen in many old gardens, of which the natural soil was once a retentive clay.

In due time we shall revert to the culture of this root, being satisfied that notwithstanding certain and serious impediments, tending to frustrate the best directed attempts to cultivate Turnips, especially in the Southern low lands of this country, on any thing at all approaching the scale on which it is practised in England, the Swedish Turnip might still be made to contribute largely and profitably to the sustenance of beasts, and so to the accumulation of manure—the fertility of the land, and the increase of all other crops. For this impression we might rely for strong support, on the heavy crops we saw, near maturity, last Autumn at Marshfield, and at Hereford Hall.

UNDER-DRAINING.

ONE OF THE GRAND IMPROVEMENTS IN PROGRESS TO SUPPLY BREAD TO THE INCREASING POPULATION OF ENGLAND.

THERE are now in progress, in Great Britain, two great and fruitful means of adding to the Agricultural products of the country, so much needed by the growth of her population, to wit: UNDER-DRAINING AND IRRIGATION. Of these two great modes of fertilizing land, the one the most expensive, the other the most beautiful of all agricultural operations; the latter only, in the opinion of an American citizen of profound judgment, who looks at such things with the eyes of a Bacon or a Brindley, is applicable to our country to any great extent.

Under-draining, which answers its purpose only where it is thoroughly performed, is, perhaps, too expensive for *extensive use* in America. Like Iron works, the establishment of which costs so much money, few have capital equal to the enterprise, but those who have, get the better paid for their investment. We have, however, seen under-draining practised with eminent skill and success, by a very plain, unpretending, worthy farmer, in Prince Georges county, Maryland, with results that do high honor to his sagacity and forecast; and the more so as, probably, he had never read any description, or seen any specimens of the manner of conducting it. He, Mr. Somers, residing some miles below Nottingham, in Prince Georges county, has successfully under-drained boggy meadows and adjacent upland, by means of large poles laid along side of each other, and covered in a peculiar and careful manner with cedar brush, and then with sods and dirt. His example is well worthy of being imitated, and might be, at

least on a small scale, in a thousand instances in his own county, with profit and with credit; and why should not the farmer be as ambitious of credit, for the appearance of his farm, as the commander about the cleanliness and discipline of his ship, or a Colonel for that of his regiment?

On the importance of *draining*, so much neglected in our country, as far as our observation has extended, (with some memorable exceptions, such as may be seen at Indian Hill,) we can only repeat the persuasion heretofore expressed, that next after, if not before thorough tillage, in importance, as in fact, it should precede all tillage, is *thorough draining*—a process aptly denominated the mother of all agricultural improvement. To this, the young farmer on coming to his estate should give his first attention; and here again we perceive the necessity for early instruction in the principles of hydraulics, so far at least as to know the laws which govern the rise and the running of water; for all attempts at draining must ultimately fail, if not conducted with reference to such principles, whether they be learned by experience, sometimes dearly bought, or by studying at school the science of the thing. It will ever be in vain to look for good crops, either of grain or grass, until the land has been drained of all superfluous moisture; and yet there are few farmers who might not reclaim portions of their land by draining judiciously conducted, which would, when so reclaimed, be the most productive portions of their estate, and well supply the place of such as they might profitably sell, or give to their children. At all events, such eye sores as these wet spots, throwing up useless if not noxious *grasses*, and exhaling malaria, are disgusting to look upon, and ought to be deemed as disgraceful to any practical farmer as galls on the back or shoulders of his working animals. Lindenwold, under the careful management of Ex-President VAN BUREN, is understood to exhibit remarkable specimens of perseverance and skill in the art and economy of *draining*.

In due time, as we can get opportunity, the patrons of the Farmers' Library shall be put in possession of full information as to the principles and most approved materials and system, for performing this great means of reclaiming, in many cases, the most valuable portions of their land, leaving them to decide how far they possess the means of carrying it out, each one in his own case. This is one of the cases where men of fortune and liberal spirit might render essential service to Agriculture, by putting in operation some specimens of the most approved methods of under-draining, in order to test, for the benefit of those whose more limited means make it imprudent for them to lead the way—the actual expenses and results. The scale of expenses abroad, on account of difference of cost of labor and materials, may not apply in America, but the necessary allowance on these points may be made, while the effects in regard to the melioration of the land, and the increase of its crop, would be alike in both countries.

Our readers may be interested in the testimony given before the *Tamworth Agricultural Society*, on the results of reclaiming land by under-draining, by Lord STANLEY, at a meeting of that Association last year.

"It was impossible to cast round their eyes about the country in which they lived, and not acknowledge that there had been a vast improvement in the practical agriculture of this country within the last ten or fifteen years. In producing that improvement he firmly believed that this society had borne its full share, and he should deeply regret if any circumstance whatever deprived it of that support which all who were engaged in the cultivation of the soil ought to render it. Perhaps they would permit him to make a few observations on two subjects which were of primary and vital importance in the science—for it was now becoming a science—of agriculture, without which all others were comparatively worthless. A real, effectual, and thorough draining of the soil was of vast importance in the first instance, and it was the foundation of all improvement. Now it was quite true that agriculture was not capable of that indefinite extension by which the manufacturing interest, in its rapid progress, had astonished the world, and astonished itself; but it was equally true that agriculture was capable of vast extension and improvement. The surface of the soil was limited, and the capacity of the soil was also limited; but they were limited in a much less degree than was generally supposed; and he spoke with the greatest confidence when he said that, of the waste lands of this country, a vast proportion was capable of producing a large profit on a large—an immensely large—outlay of capital expended upon it; and, considering the condition of the country, and the increasing population of the country, it was not only their interest, but it was also their bounden duty, to exert themselves, and to apply their best energies, not of sinews alone, but of the mind and intellect, to ascertain how the soil could be made more capable of supporting the population. The importance of thorough draining was universally admitted, but, perhaps, he might be permitted to state two or three facts as practical results, which had come under his own observation, showing that what he was preaching to them, he was, in a certain degree, practising himself. In the course of the last two or three years, they—he spoke for his father as well as for himself—on behalf of themselves and their tenants, had put under ground nearer three than two and a-half million of tiles, and had thus fairly indicated their belief and confidence in the success of a great experiment. And why had they done so? Every month that passed over his head convinced him that, so far from having done all that could be done, they had only made a beginning, and were only doing that which it was not only their bounden duty, but, still more, their abundant interest to do. He would state one instance of the practical returns which might be expected from thorough scientific draining. In 1841, his father was about to inclose in the park at Knowsley, a

tract of about eighty acres. Of this eighty acres about twenty were strong clay land, with a very retentive subsoil, and the remaining sixty he remembered from his boyhood as the favorite haunt of snipes and wild ducks, and never saw there any thing else. In the course of the first year the sixty acres maintained, and maintained very poorly, during the summer, six horses; and on the twenty acres there was a very small crop of very poor hay. It was impossible for land to be in a poorer condition; and they would agree with him when he told them that, in breaking it up, they had some two or three times to dig the plough horses out of the bog. In 1841 the whole of this land was thoroughly subsoiled and drained, and in 1842, what was not worth 10s. an acre the year before, was in turnips, and on that land they fed off in five months, and fattened for the butcher, 80 beasts and 300 sheep, and afterwards carted into the farm-yard 350 tons of turnips. In the present year they had a very fair crop of barley and oats, which his friend Mr. Henry would be very glad to show to any gentleman who felt any curiosity on the subject. Now he did not hesitate to say that that land was, at that moment, worth 30s. an acre. The outlay upon it for pulling up old fences, thorough draining, tilling and breaking it up, amounted to just £7 10s. per acre, just giving 20s. for every 150s. of outlay, and giving to the landlord a permanent interest of 14 per cent. on the money laid out on that unpromising ground. It happened that, in the same year, they took into their own hands land which had been abandoned by the tenant as perfectly worthless. It was a large field of twenty-two acres of very poor sandy soil. It was drained at an expense of £2 per statute acre, and in the first year they fed off on that land 120 sheep, the remaining part of the turnips being carted to the farm-yard, and he ventured to say that, at the expense of £2 per acre, the land as increased in value 10s. per acre to the landlord and 10s. to the tenant.

IRRIGATION.

HOW CONDUCTED—ITS VALUABLE RESULTS STATED.

THIS is one of the two great fertilizing expedients, of which we have already spoken, as now operating wonders for the agriculture of England; *under-draining*, as there practised, being too costly for American Farmers generally, while *irrigation* is within the means of many, on whose estates springs and streams of larger or smaller volume, invite this use of a great and cheap resource for the increase of their crops, as well of grain as of grass.

Here we take leave to repeat from a discourse delivered recently before, and at the request of the New-Castle county, Delaware, Agricultural Society, a few remarks which we had there the honor to submit, on the value of this operation:

Irrigation is, in my view, another means of augmenting agricultural products in a degree that farmers seem not to be generally aware of; and there is not a district teacher in the State who might not in a few hours comprehend and instruct his pupils in the *rationale* of this important operation. A single chapter in such text books as you ought to have provided for your common schools, with diagrams to illustrate the process, would render the whole subject at once familiar to the dullest capacity. 'It is apparent to the most superficial observation,' says an experienced writer on this topic, 'that the places contiguous to springs, over which their waters continue to *flow*, are ever covered with a conspicuous verdure of the sweetest grasses; while stagnant water converts the land into *marsh*, productive of nothing but coarse and unpalatable aquatic plants. To imitate this process of nature constitutes the leading principle of *irrigation*.' In fact, my friends, the object of the physical sciences, at the mere suggestion of which, in connexion with their business, practical farmers are prone to take alarm, after all, is but to observe and to imitate and regulate the processes of nature.

How many there are who have small streams passing through their farms, which, if taken at their sources and conducted along the highest line that the water would flow, might be made to irrigate and fructify every acre over which they could be turned; and he must be slow in the comprehension of his interest, who does not see how profitable, under favorable circumstances, is all land kept under the scythe, compared with that which demands frequent plowing, especially in a country like ours, where the dearness of farm labor stands like a 'lion in the path' of rural improvement. In the practice of this important and beautiful operation, our country is, especially, much behind others which are much in the rear of us in general intelligence, and in that natural shrewdness and readiness to take a hint which is said to characterize 'the universal Yankee nation.'

The writer on irrigation, who laid down the general principle in the words I have quoted, gives many very striking instances of the profits resulting from it in England and Scotland, as well as on the Continent; otherwise, I have heard the rules and results of irrigation no where so well stated as by Mr. Webster, with his usual clearness, on his return from England. Under a strong persuasion that this is a practicable but much neglected resource, within the reach of American farmers, you will bear with me while I rehearse a few of the examples to show the advantages of irrigation given by the writer already mentioned.

R. K. Campbell, of Kailzie, commenced irrigating, by forming 5¾ acres of the lower part of his lawn into water meadow. In its natural state it was worth $10 an acre yearly rent, which some years since was the yearly rent of the Delaware meadows, below Philadelphia.

The formation of the meadow cost $37 50 per acre, and, for the last 20 years, the grass produce of this land, in hay and after-grass, has been, annually, $55 per acre—the hay crop being 6,600 pounds per acre of the finest quality. The same gentleman has another irrigated meadow of 2¾ acres, formed out of a perfect bog, only worth originally 5 shillings annual rent per acre. The expense of forming this meadow was $27 50 per acre. It has since yielded, in hay and after-grass, to be fed off to sheep an annual income of $27 50, in place of $1 25 per acre.

The late Sir George Montgomery, in 1815, converted 9 acres of partly boggy and the remainder dry soil, worth ten dollars yearly rent, into irrigated meadow, at a cost of $25 per acre. It has since yielded 6,600 lbs. of very superior hay to the acre, and its gross produce is $55 per acre. In 1802, a 9-acre lot, belonging to the Duke of Bedford, was prepared for irrigation, and in 1803 it produced as follows: In March, it was stocked with 240 sheep, for 3 weeks, at 6d. each per week, making £18, or $10 an acre, for the *spring* feed alone. In June, mowed 2 tons of hay to the acre, worth, as per statement, $26 a ton; August 20, mowed again 1½ ton an acre, at £4 per ton; September 16, put on 80 fat sheep, for 3 weeks, at 4d. each per week; and then it fed lean bullocks, not reckoned in the account—making from the 9 acres $740, or $80 per acre of annual produce.

I once heard Mr. Crowninshield, then Secretary of the Navy say that he gave $100 an acre for land in Massachusetts, and had to pay $50 an acre to *clear it of stone*, before it could be plowed. I saw land being ditched, cleared, and cleansed of alders and stone, at Indian Hill, in Massachusetts, requiring more labor to get up one acre than is expended in the ordinary way on 100 acres in Delaware or Maryland. But what is impossible to indomitable perseverance? The very aspect of such land is terrible to a Southern man; yet, suppose, by an outlay of $10, or even $20, or $30 an acre, in ditching, draining, or irrigation, a Delaware farmer would, as many might, reclaim otherwise worthless land, making it produce, without further cultivation, say 2 tons of hay, worth on the spot at least $10 per ton, at the same time dissipating sources of autumnal disease, and rendering his farm at once more beautiful and more productive; how much better and more patriotic would it be than pusillanimously to flee across the mountains, he knows not where, far away from the grave of his fathers and the endearing associations of his youthful pastime, ay, and of youthful sorrows? Has not he already lost the best part of his nature who has ceased to feel in heart that there is, indeed, "no place like home?" Would that Americans could forego the love of change for change sake, and acquire, in place of it, something of that love of home, however humble it be, which prompted one of England's best poets to say of the Swiss,

"Dear is that shed to which his soul conforms
And dear that hill which lifts him to the storms."

But, when driven to seek a home in other States, there are districts near at hand, in some of the "Old Thirteen," far more inviting than the rude borders and dense forests of the distant West.

Liebig informs us that "in the vicinity of Liegen, (a town in Nassau,) from three to five perfect crops are obtained from one meadow, and this is effected by covering the fields with river water, which is conducted over the meadow in Spring by numerous small canals. This is found to be of such advantage, that supposing a meadow not so treated, to yield one thousand pounds of hay, then from one thus watered 4500 pounds are produced. In respect to the cultivation of meadows, the country around Liegen, is considered to be the best in all Germany."

ON IRRIGATION....By Rev. W. L. Rham.

Of all the substances which concur in the vegetation and growth of plants, water is the most essential; without moisture the seed cannot germinate, nor can the plant receive nourishment. Hence, in warm climates, where rains are periodical, and where the soil is dried and parched by a continued evaporation, no verdure exists, except where springs or rivers supply the waste of moisture. The warmer the climate and the more rapid the evaporation, the more luxuriant is the vegetation, provided there be an abundant supply of water. This circumstance has suggested the plan of diverting streams and conducting them in channels to fertilize as great an extent of land as possible.

In China and in India, as well as in Egypt, ingenious modes of watering lands have been adopted from the most remote ages. No expense has been thought too great to secure a supply of water, and to distribute it in the most advantageous manner. It seems that where there is great heat in the air, water alone will supply the necessary food for the growth of plants. It is probable that the component parts of the atmosphere are more easily separated, and made to enter into new combinations with those of water, in a high temperature than in a lower; or that the leaves and green parts of vegetables imbibe water in a state of solution in air, and that in this state it is more easily decomposed. Atmospheric air and water contain all the principal elements of vegetables, viz. oxygen, hydrogen, carbon, and nitrogen; the remainder are either found in the soil or diffused through the water. Manures seem to act principally as stimulants or reagents, and are themselves composed of the same elements: they are of no use unless diffused or dissolved in water; but when the water is impregnated with animal or vegetable substances, the effect is far greater and more rapid than when the water is pure.

Water has also an important office to perform, if we admit the principle discovered by Macaire, that plants reject through their roots those portions of the sap which are the residue of its elaboration, and which are of no further use to the plant, but rather injurious if they are again imbibed by the roots. Plants seem to require a removal of their excrements, as animals do when tied up in stalls or confined in a small space. If this is not effected, they suffer and contract diseases. The percolation of water through the soil is the means which Nature has provided for this purpose. Hence we can readily suppose that the mere washing of the roots has a beneficial effect, and to this in a great measure must be ascribed the fertilizing effects of pure and soft running water.

If water stagnates and is evaporated, and the noxious matter held in solution remains in the soil, all the advantage of irrigation is lost, and the better kinds of grasses are succeeded by

rushes and coarse aquatic plants, as may be seen in all marshy spots. The circulation of the water, therefore, appears to be as necessary as its presence; and, provided there be a sufficient supply of water of a proper quality, the more porous the soil, and especially the subsoil, is, the more vigorous is the vegetation. It is on this principle alone that we can rationally account for the great advantage of irrigation in those climates where rain is abundant, and where the soil, which is most benefited by having a supply of water running through it, is of a nature to require artificial draining as an indispensable preliminary to being made fertile by irrigation. By keeping these principles in view, great light will be thrown on the practical part of irrigation, which, having been long established by experience, before these principles were thought of, depends not on their correctness, but only confirms their truth.

The whole art of irrigation may be deduced from two simple rules, which are, first, to give a sufficient supply of water during all the time the plants are growing, and, secondly, never to allow it to accumulate so long as to stagnate.—We shall see hereafter one apparent exception to this last rule, but it will be readily explained.

The supply of water must come from natural lakes and rivers, or from artificial wells and ponds, in which it is collected in sufficient quantity to disperse it over a certain surface. As the water must flow over the land, or in channels through it, the supply must be above the level of the land to be irrigated. This is generally the principal object to be considered. If no water can be conducted to a reservoir above the level of the land, it cannot be irrigated. But there must also be a ready exit for the water, and, therefore, the land must not be so low as the natural level of the common receptacle of the waters, whether it be a lake or the sea, to which they run. The taking of the level is, therefore, the first step towards an attempt to irrigate any lands.

Along the banks of running streams Nature points out the declivity. A channel, which receives the water at a point higher than that to which the river flows, may be dug with a much smaller declivity than that of the bed of the river, and made to carry the water much higher than the natural banks. It may thence be distributed so as to descend slowly, and water a considerable extent of ground in its way to rejoin the stream. This is, by far, the most common mode of irrigation, and the shape, size, and direction of the channels are regulated by the nature of the surface and other circumstances, which vary in almost every situation. A few examples will give to those who are not acquainted with the best modes of irrigating land a pretty accurate notion of the system.

We shall suppose a river to run with a rapid current between high banks. At some point of its course a portion of the water is diverted into a canal dug along the bank, with a very small declivity. The water in this canal will flow with less rapidity than the river, but will keep the same level as that part of the river where it has its origin. Thus the water may be carried over lands which are situated considerably above the bed of the river farther down. All the lands between this canal and the river may be irrigated, if there is a sufficient supply of water. The canal may be carried to considerable distance from the river. The size of the canal and its declivity depend on the quantity of water which may be made to flow into it. A dam is often constructed across a river, in order that as much of its water as is possible may be diverted, and the original channel is often laid quite dry, to take advantage of all the water at the time when it is advantageous to irrigate the land. To have an entire command of the water, there are flood-gates on the main channel and on the lesser branches. By opening or shutting these, the water may be stopped or made to flow, as may be required. It must be remembered, that to carry water to a considerable distance, and in great quantity, a larger channel and more rapid declivity are required; and it is a matter of calculation whether it is most advantageous to bring a smaller quantity to a higher point, or a greater abundance somewhat lower. Having a certain command of water, it may be carried from the main channel by smaller branches to different points, so as to irrigate the whole equally.—These branches should be nearly horizontal, that the water may overflow the sides of them, and be equally distributed over the land immediately below. Every branch which brings water over the land should have a corresponding channel below to carry it off; for the water must never be allowed to stop and stagnate. When it has run 15 or 20 feet, according to the declivity, over the land situated below the *feeder*, or the channel which brings the water, it should be collected into a drain to be carried off, unless it can be used to irrigate lands which lie still lower. Finally it runs back into the river from which it was taken, at a lower point of its course.

When there is a considerable fall and a sufficient supply of water, a series of channels may be made, so situated below each other, that the second collects the water which the first has supplied, and in its turn becomes a feeder to irrigate the lower parts of the declivity: a third channel receives the water and distributes it lower down, until the last pours it into the river. This is called *catch-work*, because the water is caught from one channel to another. This method is only applicable where there is a considerable fall of water and a gentle declivity towards the river. But it must be borne in mind that the water is deteriorated for the purpose of irrigation, when it has passed over the land, and that it is not advantageous to let it flow over a great extent when a fresh supply can be obtained: but where only a small portion of water can be commanded, that must be made the most of; and it will irrigate three or four portions of land in succession, without there being any very marked difference in the effect: beyond this it rapidly loses its fertilizing qualities. This is not owing to the water having deposited the fertilizing substances which it held in solution, or which were diffused through it, but it is owing to its having taken up some which are detrimental to vegetation, and being saturated with them: at least this is the most probable opinion, when all circumstances are taken into the account.

The general principle of irrigation may be described as the supplying of every portion of the surface with an abundance of water, and taking it off again rapidly. In many situations the great difficulty in irrigation arises from the want of a supply of water; but even then a partial irrigation may be effected, which, although not perfect, will have its advantages. A small rill, which is often quite dry in summer, may still, by judicious management, be made to im-

prove a considerable portion of land: its waters may be collected and allowed to accumulate in a pond or reservoir, and let out occasionally, so that none be lost or run to waste. If there is but a small quantity, it must be husbanded and made to flow over as great a surface as possible. If there is water only at particular seasons of the year, and at a time when it would not be of much use to the land, it may be kept in ponds, and it will lose none of its qualities by being exposed to the air. If animal or vegetable matter, in a partial state of decomposition, is added to this water, it will much improve its quality, and, by a judicious distribution of it over the land, a great benefit may be obtained.

If there is not a want of water, there may be a want of declivity to enable it to flow off, which, it should always be remembered, is an essential part of irrigation. Art may in this case assist Nature by forming a passage for the water, either in its course towards the land to be irrigated, or from it after it has effected its purpose. Where there is no natural exit, and it might lead to too great an expense to make an artificial one, the water may sometimes be led into shallow ponds, where a great part is evaporated; or porous strata may be found by boring, into which it can be made to run and be dispersed. Along rivers, where the fall is very imperceptible, a channel, brought from a considerable distance, may give such a command as to throw the water over a great extent of surface; and, to carry it off, another channel may be cut, emptying itself at some distance below: so that lands which lie along the banks of a river may be irrigated, although they are actually below the level of the river, and require banks to protect them from inundation.

When the surface to be irrigated is very flat and nearly level, it is necessary to form artificial slopes for the water to run over. The whole of the ground is laid in broad beds, undulating like the waves of the sea. The upper part of these beds is quite level from end to end, and here the channel or float which brings the water on is cut. From the edge of this channel the ground is made to slope a foot or two on both sides, and a ditch is cut at the bottom parallel to the float. The whole of the ground is laid out in these beds. All the floats are supplied by a main channel at right angles to the beds, and somewhat above them; and all the ditches or drains run into a main ditch, parallel to the main float, and below the lowest drain. The course of the water is very regular. As soon as the flood-gates are opened, it flows into all the upper channels, which it fills till they overflow in their whole length. The sloping sides are covered with a thin sheet of running water, which the lower drains collect and carry into the main ditch.

WATER MEADOWS.

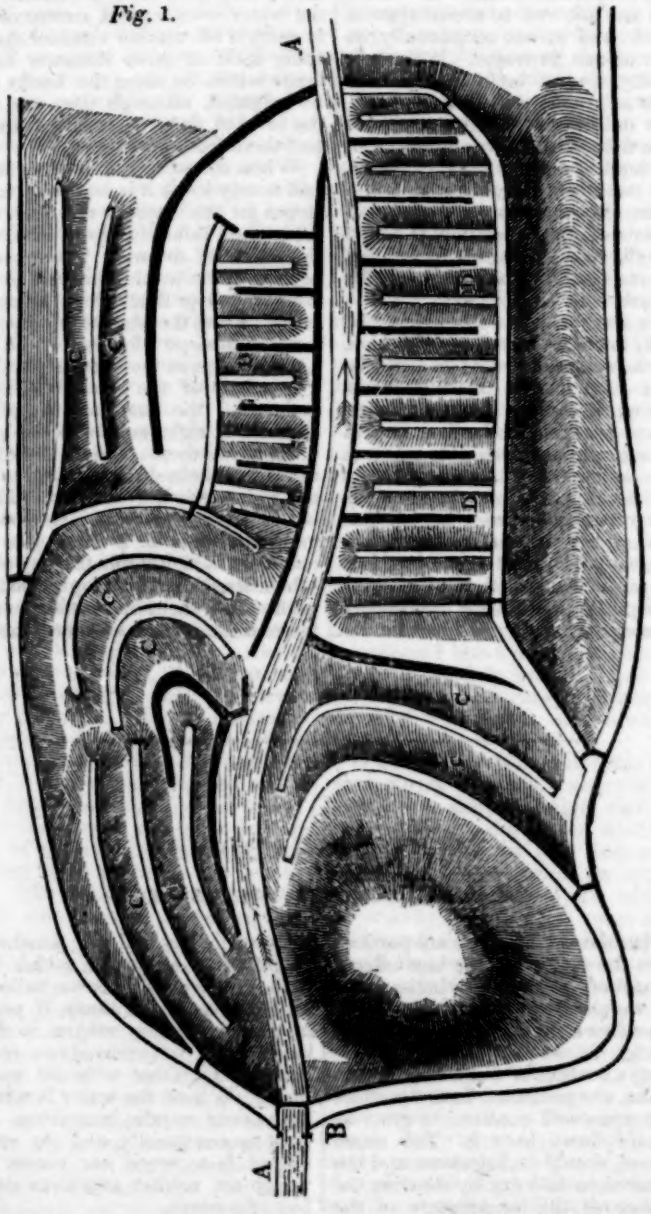
HOW MADE AND MANAGED.

EXPERIENCE has shown that there are particular seasons when the water has the best effect; a perfect command of it is therefore indispensable, and also a regular supply. During frost, when all dry meadows are in a state of torpor, and the vegetation is suspended, the water-meadows, having a current of water continually flowing over them, are protected from the effect of frost, and the grass will continue to grow as long as the water flows over it. Too much moisture, however, would be injurious, and the meadows are therefore laid dry by shutting the flood-gates, whenever the temperature of the air is above freezing. By this management the grass grows rapidly at the first sign of Spring. Before the dry upland meadows have recovered the effects of frost and begun to vegetate, the herbage of the water-meadows is already luxuriant. As soon as they are fed off, or cut for the first crop of hay, the water is immediately put on again, but for a shorter time; for the warmer the air, the less time will the grass bear to be covered with water. A renewed growth soon appears, and the grass is ready to be cut a second time when the dry meadows only give their first crop. Thus, by judicious management, three or four crops of grass are obtained in each season, or only one abundant crop is made into hay, and the sheep and cattle feed off the others. The usual way in which the grass of water-meadows is made profitable is by feeding ewes which have early lambs till the middle of April. A short flooding soon reproduces a crop, which is mown for hay in June; another flooding gives an abundant aftermath, which is either mown for hay, or fed off by cows, bullocks, and horses; for at this time the sheep, if pastured in water-meadows, are very subject to the rot. The value of good water-meadows could scarcely be believed by those who are not familiar with them. Where the water is suited to irrigation, they never require manuring. The fertility is kept up continually, and the only attention required is to weed out coarse aquatic plants, which are neither nutritious nor wholesome in hay or pasture.

The best soil for a water-meadow is a good gravel. The finest water-meadows on the Avon in Wiltshire, where the richest herbage is found, have scarcely any soil at all, but are on a bed of shingle and pebbles, matted together by the roots of the grass, which proves to demonstration that the waters of the Avon contain all the principles essential to rapid vegetation. Great attention is required, and some experience, to irrigate meadows so as to give the greatest profit.

In hot weather, when we should imagine that the land must be thirsty, and that too much water cannot be poured over it, much mischief may be done by injudicious flooding. In Winter, on the contrary, the land may be covered with water for weeks without injury; and, if an earthy deposit takes place, the subsequent fertility is greatly increased. But this is not properly irrigation: it is inundation, and the effects depend

Fig. 1.



on entirely different causes. When low meadows are inundated in Winter and Spring, it is the muddiness of the water which enriches the land: a fine layer of extremely divided matter is deposited, and, when the water subsides, this acts as a coat of manure.

Water may be carried in small channels through meadows without being allowed to overflow; and in this case the effect is similar to that caused by rivers or brooks, which wind slowly through valleys, and produce a rich verdure along their course. This is watering, but not properly irrigating. When this is done judiciously, the effect is very nearly the same as when the land is irrigated; and in hot climates it may be preferable, by giving a constant supply of moisture to the roots, while the plants are growing. The great advantage of water-meadows in England is not so much the superior quantity of grass or hay which is obtained when they are mown, as the early feed in Spring, when all kinds of nutritive fodder are scarce; when the turnips are consumed before the natural grass or the rye sown for that purpose is fit to be fed off, the water-meadows afford abundant pasture to ewes and lambs, which by this means are brought to an early market. The Farmer who has water-meadows can put his ewes earlier to the ram, without fear of wanting food for them and their lambs in March, which is the most trying season of the year for those who have sheep. At that time an acre of good grass may be worth as much for a month as a later crop would for the remainder of the year. When it is intended to form a water-meadow on a surface which is nearly level, or where a fall of only two or three feet can be obtained in a considerable length, the whole of the land must be laid in beds about 20 or 30 feet wide—the middle or crown of these beds being on a

level with the main feeders, and the bottoms or drains on a level with the lower exit of the water, or a little above it. To form these beds most expeditiously, if the ground is already in grass, the sod may be pared off and relaid after the beds are formed, by which means the grass will be sooner reëstablished; but except in very heavy soils, where the grass is some time in taking root, the easiest and cheapest way is to plow the land two or three times towards the centre, and dig out the drain with the spade: the earth out of the drains, and that which is taken out of the upper trench or feeder, may be spread over the bed to give it the proper slope. A roller, passed over the bed in the direction of its length, will lay it even; and, the seeds of grasses being sown over it, the water may be let on for a very short time to make them spring. As soon as the grass is two or three inches above ground, a regular flooding may be given, and in a very short time the sward will be complete. Instead of sowing seed, tufts of grass cut from old sward may be spread over the newly-formed beds, and they will soon cover the ground. The Italian rye-grass, which has been lately introduced into this country from Lombardy and Switzerland, grows so rapidly, that if it be sown in February, or as soon as the snow and frost are gone, it will afford a good crop to feed off in April, or to mow for hay by the beginning of May; and after that it may be cut repeatedly during the Summer. But where the soil is good and the water abundant, good natural grasses will spring up without much sowing, and soon equal the old water-meadows.

It seems essential to the formation of a good water-meadow that the bottom be porous and free from stagnant water; hence under-draining is often indispensable before a water-meadow can be established; and a peat-bog, if drained and consolidated, may have water carried over its surface, and produce very good herbage. If the soil is a very stiff clay, draining is almost indispensable where a water-meadow is to be made. The more porous the soil, the less depth of water is required, which is not obvious at first sight; but the clay lets the water run over the surface without soaking into the roots, whereas the porous soil is soon soaked to a considerable depth. The water must therefore be longer on the clay than on the sand or gravel, to produce the same effect. If the water is properly applied, all kinds of soils may be converted into fertile water-meadows. On very stiff clays, a coat of sand or gravel, where it can be easily put on, will greatly improve the herbage. It should not be plowed in, but laid on the surface two or three inches thick: chalk will also improve the herbage.

The usual time of letting on the water on water-meadows is just before Christmas, and it may continue to flow over the land as long as the frost lasts: in mild weather it may be turned off during the day and put on again at night until the frost is gone. The grass will soon begin to grow, and be ready to be fed off. When this is done, the water is immediately let on for a short time, and turned off again to allow the ground to dry after a few days' flooding, and the water is let on again at short intervals. The warmer the air is, the shorter time must the water be allowed to cover the meadows. As soon as the grass is five or six inches long, it must be left dry entirely till it is mown or fed off. In Summer the floodings must be very short, seldom more than twenty-four hours at a time, but frequent. Thus a great weight of grass may be obtained, year after year, without any manure being put on the land—care being taken that, where the surface is not quite even, the hollows be filled up with earth brought from another place, or dug out of the drain, if that should be partially filled up with the soil which the water has carried into it. We alluded before to a case where water may remain a considerable time on the land without injury; this is when there are inundations from rivers, which rise above their beds in Spring, and cover the low meadows which lie along their banks. In this case the grass, which had not yet sprung up, is protected from the cold; and, if there is a deposit from the water, there is a considerable advantage. But, when it subsides, it must be made to run off entirely, without leaving small pools, by which the grass would invariably be injured. Small ditches or channels are usually dug, by which all the water may run off, unless where the subsoil is very porous, or the land is well under-drained, which is seldom the case in these low meadows, for the drains would be apt to be choked by the earthy deposit from the water. These inundations can sometimes be regulated by means of dykes and flood-gates, in which case they partake of the advantages of irrigation, and also of that deposition of fertilizing mud which is called warping. [WARPING.]

The preceding plan (*Fig.* 1) will explain what has been briefly said respecting the different modes of irrigating land. A A is a river, which has a considerable fall, and then flows through a level plain. A considerable channel is cut at B, where there is a rapid fall over a natural or artificial dam. This channel is carried round a hill and supplies a series of channels, C, C, C, placed below each other, forming catch-work along a declivity. A portion of the water goes on to D, where it supplies the feeders of a regular set of ridges, or beds, made as before described, from which the water returns into the river by a main trench, into which all the drains run.

On the other side of the river, where the slopes lie somewhat differently, there are several examples of catch-work, the black lines representing the drains which receive the water after it has flowed over the surface and carry it into the river below. It is evident that all the feeders are nearly horizontal, to allow the water to flow over their sides.

Fig. 2.

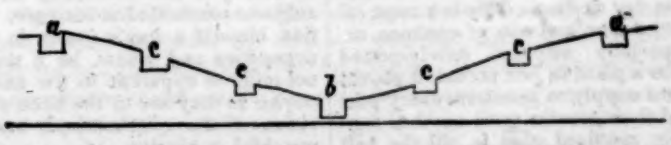


Fig. 2 is the section of catch-work. *a*, *a*, are the feeders; *b*, the drain; *c*, *c*, *c*, *c*, intermediate channels which act as feeders and drains.

Fig. 3.

Ridge-work.

Fig. 3 is the section of two adjoining ridges. *a*, *a*, the feeders; *b*, *b*, *b*, the drains.

Fig. 4.

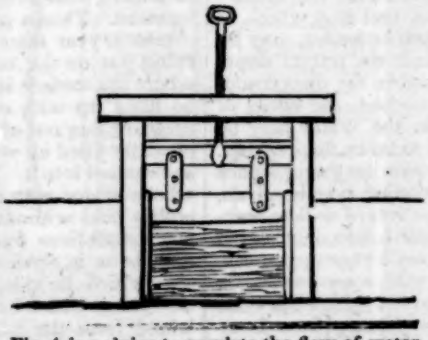


Fig. 4 is a sluice to regulate the flow of water.

PLANT WATERING.

As good potting is the first step in plant growing, so good watering is most assuredly the second; the former, even when rightly accomplished and with the best materials, may be defeated through want of skill in watering.—Imperfect knowledge or carelessness in the due administration of this essential element kills more plants, or keeps more in suspense between life and death, than utter ignorance in all other matters relating to plant growing. Let us not imagine that because we have put a root to a plant, and placed it in a pot in the right way and in the proper kind of soil, that the object of our solicitude is accomplished, and that our duty is terminated; for the contrary is the fact, if we have ambition enough to desire our achievements to be admired or recorded.

It may be superfluous to state, that plants either suffer from too much or too little water; but it is not so to show that this is frequently the case in the same pot at the same time; that is an evil far more extensive in a general collection of plants than may be supposed, and a point opposed to good cultivation earnestly demanding our attention. When the surface-soil in the pots becomes dry, a careless hand adds at once a fresh supply, without ascertaining whether the soil, in which the roots are, at all requires it, and again on the other hand, the top soil frequently appears perfectly wet, while the bottom of the ball is as dry as dust. This is a most calamitous circumstance, and one of common occurrence, especially amongst newly-potted plants. When a plant is just potted, it should have a sufficient supply to penetrate every part of the ball, and then remain until another supply is positively required, that is, till the ball has parted with a greater portion of its moisture and the plant is upon the point of flagging, the interstices being all filled with air as it should be. This air again requires to be driven out by a fresh supply of water, thus keeping up a vigorous and healthy action by continual interchanges of air and water, but at the same time never allowing either of them to remain long enough to affect the health of the plant. Watering by "driblets" is the worst of all watering; it keeps the surface of the soil in a puddle, but never reaches the roots; the eye is thus deceived, and the plant is often dead before the cause is discovered. When a plant does not part with its moisture freely, like its neighbors, but remains in a wet state, it should be immediately inspected; for should a plant remain subject daily to the application of driblets of water for any time, death must of necessity ensue. One effectual watering, whether applied to plants in pots under glass or to those committed to the soil in the open ground, is not only of far greater utility, but much more economical than ten ineffectual supplies. There is no duty attending plant cultivation so difficult to perform as this, and to entrust it in careless and incompetent hands will certainly entail upon a collection of valuable plants positive ruin; for unless he who uses the watering-pot has some practical acquaintance with vegetable economy, and can discriminate so far as to act agreeably to the necessities and wants of the subjects committed to his care, he will always find himself a day's march in arrear. These necessities and wants, be it remembered, are not quite so apparent to the naked eye of the novice as they are to the keen and scrutinizing vision of the ever-anxious, and hence ever-watchful, cultivator

There is a kind of watering very commonly performed in many places, which cannot, when

valuable and choice plants are attempted to be cultivated, be too severely censured. This is the daily afternoon supply, which is given to every plant as far as time will admit, regardless of its requirements.—at least, when this operation is entrusted to men of inexperience, which is but too common; and this kind of gardening goes on in many places for years. Plants die, it is true; but this is one of the unresolved mysteries in gardening, which, to some minds, is quite satisfactory, and enables them to account for the loss of plants by violent means. Finally, it has been asked, how often are we to water this or that plant, and the answer usually is, always when it requires it; let us, therefore, add, and with some earnestness, *never before.* [Duro.

ENTOMOLOGY:

OR, A DISCOURSE ON INSECTS.

"A wise hand has scattered them every where, and given to each kind its particular instinct, its peculiar economy, and great fecundity."

"From the gigantic banyan, which covers acres with its shade, to the tiny fungus, scarcely visible to the naked eye, the vegetable creation is one vast banquet, at which her insect guests sit down." The experience of every practical Farmer will bear its testimony to the truth of this assertion, which we quote from an eminent work on Entomology, not for the purpose of spreading a truth which must be universally admitted by every intelligent observer of Nature, but as an apology, or, rather, a reason, for occupying a few pages of an early number of the Farmers' Library with the remarks to which it properly leads.

Experience also teaches every cultivator of the soil that innumerable varieties of this minuter portion of the animal kingdom are unbidden and costly "guests" at his own private table—feeding on his industry, preying on his means, and diminishing his profits.

Decandolle and other Entomological writers have calculated that the number of these insects which draw their sustenance from herbivorous plants, amounts to 100,000 species. Some of these feed only on one kind of plant, while others inhabit a plant in one section, or season, and not in another. One species, furnished by Nature with an organic machinery, admirably adapted for boring or burrowing in the earth, assails the root; another inserts its proboscis in the fibre of the leaf, and extracts only the sap; this eats only the parenchyma, never touching the cuticle; that devours the lower surface of the leaf; while a third perforates the stem.—Obedient to its instinct, each individual species industriously contributes its share to the general desolation; and the practical acquaintance with these periodical ravages which has been forced upon the Farmer, has hitherto produced no remedies, or, at best, such only as are partial and uncertain, for an evil so extensive. While the provident housewife industriously destroys the loathsome vermin *(cimex lectularius)* which infest her dormitories, her less persevering spouse, in indolent despair, permits all the residue of the Hemipterous family, undisturbed, to feed on his crops, and then patiently replants, to supply them with a fresh banquet. Content to tread in the footsteps of the ages which have preceded him, he looks at every diverging path with contempt or dismay; and hence it is that, until of late years, improvements in Agriculture have been so much behind the advance of knowledge in every other useful art. This reproach, it is true, bears less heavily on our day than it did formerly. A liberal, intelligent spirit has lately been infused, the tendency of which is to enliven and elevate our system of Agriculture, and to enhance the reputation of those to whose hands it is committed; and of all the occupations of life, which presents a wider or more attractive range to the philosophic mind? Not that we are to expect every tiller of the soil to overleap the adverse circumstances of his condition, and to penetrate and comprehend the numerous processes in the economy of Nature. But the duty, no less than the interest, of every gentleman Farmer—by which phrase is intended, merely, him whose days are not all necessarily required for manual labor—prescribes the employment of a portion of his leisure hours in pursuits and researches which will not fail to invigorate and embellish his practical knowledge. To such we would suggest, generally, the importance of a course of reading in Natural History; and, particularly, of a competent acquaintance with that one, among the most interesting of all its branches, called "Entomology"

—and for such reading we propose to supply the materials, in part, in the "FARMERS' LIBRARY."

Entomology—derived from two Greek words *(entoma* and *logos)* signifying a discourse on insects—treats of the "organization, habits, properties and classification of those articulated animals which are distinguished by the presence of *antennæ* (antenna, a Latin word for *yard-arm)* and of breathing organs, composed of ramified trachea, with or without air sacs." Various writers, from Linnæus to the latest entomologists, have suggested classifications of the insect tribes. The first-named writer classed them from their *wings*; Fabricius from the *structure of the mouth*, and Latreillo from a view of their general organization: Kirby, a more modern writer, adopts the *number of legs* as a basis of classification; while Kollar thus describes them:

"Insects are animals which have a body consisting of one or more divisions; articulated feet; a head conspicuously distinct from the body, on which are placed two moveable horns, called *antennæ*. They breathe through air-holes, which are situated on the sides of the body; the greater number having wings, in their perfect state, and only a proportionably small number are entirely without them.—With the exception of certain groups, all insects have six feet, and their bodies are divided into a head, thorax, and abdomen, by notches or incisions; hence the name *insect* is derived from the Latin word *inseco*, to cut or notch. Before they attain their perfect state, they are subject to various transformations, which are called metamorphoses."

By the researches of these and others who have devoted their time and talents to a patient and laborious investigation of the subject, great additions have been made to the stores of useful knowledge. The science, however, is still in its infancy—a vast field remains to be explored—and it is in the power of the Farmer greatly to aid the entomologist, by observing the minute, but varied and interesting, habits of insects. He would thus inform himself of the periods, the form, and the manner of their appearance; of the plants which are their favorite food; of the modes of their approach, and the parts which they select for their attacks. By adding experiment to observation, he might also obtain a knowledge of their antipathies; and in this way render Entomology more subservient to the interests of Agriculture than it has hitherto been.

It is to this latter point that it appears the proper province of the Farmer to direct the course of this department of Natural History.—Entomologists, lured by the love of research, may well content themselves with the development of such facts as will satisfy the curious philosopher; and, without going beyond this, they have a strong claim to the gratitude of the practical Agriculturist, for whose benefit they have opened the mine of Knowledge, which they offer to him to explore at his pleasure.—From their investigations he may learn that the ravages on the turnip crop are caused, first, by the *turnip flea*, (the *Chrysomela nemorum* of Linnæus,)—a coleopterous* or hard-shelled insect, scarcely an eighth of an inch in length—smooth, shining, and of a brassy color—which attacks the turnip, both in its perfect and larvæ state; its favorite food being the young plant, just as it is beginning to unfold its cotyledon, or cup-shaped leaves—stripping an entire crop with astonishing celerity. The next enemy of the turnip plant is the *saw-fly, (athalia spinarum,)*—so called because the instrument with which Nature has supplied it to deposit its eggs, which is placed at the extremity of the abdomen of the female, on the under side, resembles, in its construction and properties, the saw and auger. The eggs of this fly are deposited on the young turnip plants, from which they emerge into larvæ, with a rapidity which scientific men find it difficult to explain. These larvæ, of a deep black color, as soon as hatched, commence their attacks, which they continue until their full growth, a period of a few weeks, when they drop from the plant among the rotten leaves, and speedily enclose themselves in a cocoon, composed of two distinct layers of silk, out of which it gnaws its way when the fly is matured. Inexplicable instinct is said to teach all insects to weave their cocoon thinnest in the part which is to cover the head, to facilitate the escape of the fly when the time for its voluntary imprisonment has expired. Farmers suffer greatly from the depredations of this insect. Sir Arthur Young states that the loss of the turnip crop in England in one year, by the ravages of this insect, was estimated at $500,000. It has been known to destroy a crop of 200 acres of Swedish turnips, although a belief has prevailed that this species of turnip is comparatively safe from their attacks. The injury they inflict is the consumption of leaves to the stem, by which the plant is destroyed, or the bulb diminished by the obstruction of the vegetable functions.—The *wire worm (ataphægus lineatus)* is another enemy of the turnip plant, which cuts the stem from the root, so that the plant dies on the spot. This insect is the larvæ of chick-beetles, *(elateridæ,)* and is so constructed as to leap a great hight. The larvæ of this beetle, known under the name of wire-worm, appears sometimes, says Kollar, in great numbers, and devastates

* *Coleoptera*, (Beetles,) with six feet, and mostly with four wings, the anterior pair of which are horny, in the form of a covering for the two posterior wings, which are sometimes wanting. They have upper and lower jaws, (mandibles and maxillæ,) for gnawing and chewing; their under wings are transversely folded. Examples: the may-bug, horns, *(ceram bycidæ,)* stag-beetles, ground-beetles, *(carabidæ,)* and weevils.

whole fields of grain. It resembles the well-known *meal-worm*. *Aphides*, or plant-lice, also feed on the turnip plant. Owing to its astonishing fecundity—twenty or thirty generations being produced in a single year—the destruction caused by this insect is proportionally extensive. The fact that at one season of the year they are oviparous, and at another viviparous, is a remarkable peculiarity in the aphides; and one cause of their astonishing increase is, that the sexual intercourse of a single pair, without any reünion, serves for all the generations which proceed from the female during the whole of that succeeding year. The *turnip-leaf miners* are also among the assailants of this plant. One class of these *(dropsophita flava)* bores a gallery under the upper cuticle of the leaf, and is not visible on the under side; while the other, *(phytomyza nigrocornis,)* bred from the under side of the leaf, bores inside of the lower cuticle, and cannot be distinguished on the upper side. Various other enemies exist in the different moths of the Leodopterous order,* all of which, with different degrees of voracity, prey upon the turnip crop.

We have refrained from entering into the minutiæ of the structure and habits of each of these insects, because it would have extended this article beyond the necessary limits to which we are restricted. Enough has been said to show that, on this branch of the subject, the labor and success of the entomologist have shed a flood of light, which develops the path to further and still more useful enquiries. With reference to the *remedies* against these insect ravages—the point to which the interest of every intelligent farmer imperatively urges his pursuit—comparatively but little has yet been effected. Preventives have been suggested in English books, such as keeping the land free from the wild mustard and charlock, which attract the turnip-flea, and from other noxious breeds of insects that feed on the various products of the garden and the field—

> "But chief the forest boughs,
> That dance unnumbered to the playful breeze;
> The downy orchard and the melting pulp
> Of mellow fruit; the nameless nations feed
> Of evanescent insects."

An infusion of quassia, half an ounce to a gallon of water, has been lately recommended in the Gardeners' Chronicle. Sowing in drills instead of broadcast is said to have been found beneficial; and mixing the seed with sulphur has sometimes been of efficacy. Experimental knowledge on this subject is greatly to be desired, and every farmer has the power to contribute his mite to the general store; and apart from this consideration of personal interest, the attraction of the subject itself, when once he enters upon the study of it, will increase at long advancing step. Who can read Huber, Bevan, Gould, and other writers on the economy and habits of the Bee and the Ant, without being filled with surprise and admiration at the irresistible evidence which their system of government, domestic policy and orderly arrangements exhibit, of calculation, forethought, wise division and direction of labor, and unity of purpose?—Solomon had looked into Entomology when he referred the indolent man to the ant for a lesson of wisdom; although it is said to be an error in him and other philosophers, to suppose that the ant lays by a store of provision for winter use, when it, in fact, becomes torpid, and does not either eat or drink during the period of hybernation. What has been taken for food, was only building materials. *"Ce ne sont point des provisions de bouche; ce sont des simples materiaux, quélles font ouvrer dans la construction de leur edifice, comme elles y font outrer des brins, de paille,"* &c. But this discovery detracts from the philosopher, if from either—and not the ant, as it does not lessen the proof of his forecast and systematic industry. Linnæus speaks of the ants milking their cows, the *aphides*, (plant lice;) and Huber describes the process, stating that the ants "not only suck the sweet juice which is constantly passing through the bodies of the aphides, but make use of their attennæ during the operation, to produce a ready evacuation—patting the aphides on the sides pretty briskly," as the calf hunches the udder of its dam. This fact may show that the ant is not the enemy of these hemiptera,* as some have supposed, and that its frequent association with them is of a friendly character. But the most startling facts related by Huber, and corroborated by other writers, relate to the wars waged by one community of ants against another, and the predatory expeditions of the species called *formicans rufescens* and *formica sanguinea*, against the colonies of black ants, for the purpose of carrying off the young for slaves. But they have never been charged with selling their own children to the Turks, as is said to be the practice with a nation that is regarded as physical models of the *human* race. It has been proved by experiment that the rubescent ant has been so much accustomed to de-

* *Leodoptera*—Six feet; four membraneous wings, covered with small membraneous scales or feathers. Instead of the upper or lower mandibles, two hollow filaments exist, which, together, form a spirally rolled tongue. Examples: Butterflies, moths, and hawk-mouths.

* *Hemiptera*—Six feet, four wings—the two anterior forming hard coverings with membraneous ends, or resembling the lower ones, but being larger and stronger. Instead of upper and lower jaws, the organs of the mouth are formed of bristles, which compose a sucker, and which is enclosed in an articulated sheath, consisting of one piece, of a cylindrical or conical shape, and forming a projecting beak. Examples—the field and tree bugs, house bugs, Cicadæ Aphides. KOLLAR.

pend on the services of the black ant, that it becomes, without the aid of its slave, too indolent to provide or arrange its stores of food, and even to feed itself. The *sanguinea*, however, is more energetic and courageous, and will even protect its slaves and transport them when it becomes necessary to change their habitation.—The tact displayed by the assailants in their invasions of the black colonies, and the defensive arrangements of the latter, are given by these writers with a vividness and minuteness which invest the subject with the charm of a beautiful fiction; and by those not conversant with the study of these insects, it may be regarded as such—for any one but a close observer of insect economy and habits, would declare that such perfection of skill and management is unattainable but by human intellect.

It is worthy of remark that while, against foreign and hostile tribes, ants afford examples of skill and valor in war, in their domestic government they equally inculcate lessons of benevolence and social harmony; for while among some barbarous nations, such as the Africans, it is the custom when one faction gains the ascendant, to sell their rivals in bondage, or, what is worse, exclude them from employment and starve them to death, ants in power never make war on their fellow citizens, but always on a different species. Thus, according to an eminent naturalist, "when one fellow laborer is accidentally wounded at his work, he is assisted by others, and taken to the hospital; but if his case be evidently past the skill of surgery, his body is only then thrown away among the rubbish of the nest."

Into the boundless field of natural history, however, it is no part of the purpose of *this article* to carry the reader further than may suffice to stimulate a thirst after greater knowledge.—To men exempted from the pressing cares of life, gifted with a persevering spirit of investigation, and who have the talent as well as the time to employ in the quiet, close and patient research which it demands, the labor will bring an ample reward in the discovery of entertaining facts and the accumulation of curious and useful knowledge. To such as these the world is a great debtor. All its knowledge of the minuter organisms and various habits of the innumerable tribes of insects which draw their hourly tributes of existence from the vegetable kingdom, it owes to their indefatigable exertions.—The brief view and suggestions here thrown out are solely designed to lead the practical cultivator to that door of the temple of Knowledge which may have heretofore been unapproached by him, and, by opening to him glimpses of the treasures which may be acquired from the application of a small portion of his otherwise unemployed hours, to enable him to protect his crops, in some measure, from the depredations to which they are now annually and grievously exposed—to make the pursuits of Agriculture more attractive to intellectual minds, and to elevate the character and standing of the Farmer in the social scale. By the production of these desirable ends, the whole object of this paper would be accomplished. Still further to promote that end by the relation of anecdotes illustrative of the instinct and the habits to which we have referred, we shall give occasionally interesting particulars with which eminent men have managed to enliven their contributions to Natural History. In the pursuit of this purpose, we solicit the aid of gentlemen whose studies and observations qualify them to aid in giving to the pages of the Farmers' Library, that variety which we desire them to present, but which no one mind, however much more gifted than ours, can well impart.

P S.—At a late meeting of the Farmers' Club, on a call from the Chair for a subject for discussion at the next meeting, a gentleman of varied knowledge and experience expressed his belief that it would take millions—ay. *millions*—to repair the annual losses to the farmer and the orchardist, caused by the *ravages of insects;* and so general seemed to be the conviction of the truth of his impression, that the subject was given out as one of paramount importance, inviting the patriotic and earnest consideration of every friend of rural economy.

AGRICULTURAL INCONSISTENCIES.—Prejudice and error generally go hand in hand; a man may be allowed to indulge in obstinacy for his own gratification, but when society is effected by it, the sooner a new light breaks in upon him, the better. I proposed subsoiling my heavy land for beans, so as to admit the action of frost and air abundantly. A demurrer was instantly raised by a farmer present. Oh! we always plow shallow for beans. Well, I know you do. Do you ever double-spit your gardens? Oh, certainly we do. Do you ever grow beans in your garden? To be sure, capital ones. What, and that on double dug ground? Impossible, surely. It would puzzle a conjurer to tell why a farmer always digs his garden 20 inches, and plows his land only 5 inches. Docks, thistles, couch, and other strong deep-rooted weeds, are not to be found in his garden. What reason can a farmer give for drilling his beans at 7 inches in his field and 27 in his garden? Does the former mode give him a larger or earlier produce? Again, a farmer will caution you against sitting in a draught, or lying on a damp bed—of course he takes care not to do so himself; but whilst he practises this for himself, and recommends it to his friends, he pursues an entirely different plan with his cattle. They must be exposed to both; as if their sensations and physiology differed in that respect from our own. Let us keep our cattle warm, dry, and well-fed, and we shall seldom feel the cramp in our pockets.—*I. J. Mechi, 4 Leadenhall-street.*

[Chelmsford Chronicle.

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CANADA THISTLE.

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THE CANADA THISTLE.

We have often heard farmers in the South, lamenting the rumored approach of the Canada Thistle, and expressing a desire to become familiar with its appearance, that it might be met with resolution and vigor on its first arrival among them—it being on its way, like the red fox and other pests, in progress from North to South. The farmer, we conclude, cannot be too soon made acquainted with the "form" and (we will not say the "pressure,") characteristics of an enemy so formidable, that a Pennsylvanian writer, in the Farmers' Cabinet, vol. 2, page 358, says:—

"It has already made its appearance in several directions, to the no small annoyance of the proprietors, and if suffered to remain undisturbed, it will continue to increase until it has taken full and entire possession of the soil, to the exclusion of every other plant, and may be handed down from generation to generation as a permanent legacy. In some of the Western parts of the State of New-York, where it has partially taken possession, you may discover many respectable tillers of the soil reaping their wheat with gloves on, and binding with willows; and some fields may be seen where it has become so thickly set that the owners have given the ground up in despair, as not producing herbage enough to feed a rabbit."

We are advised, by a gentleman who speaks *feelingly* on the subject, and from painful experience, that it may be most effectually destroyed by *mowing it*, when in blossom, before it has seeded, not very near to the ground, and then pouring salt water over each spear of it—but if it be not attacked very soon after it makes its first appearance, it must become very difficult to destroy it by a process so tedious.

Noxious weeds are often spread by great carelessness on the part of the farmer himself in the purchase of his seed. If he *cannot* raise these in all cases himself, he cannot exercise too much vigilance in the purchase of them; and here, again, is an instance of the necessity of always employing as agents and factors, gentlemen of known probity and character, instead of mere upstarts and loafers, who will hold with the hare and run with the hound.

COMPARATIVE VALUE OF DIFFERENT KINDS OF SHEEP FOR THE NEW-YORK FARMER.

A chance interview with that distinguished Wheat-cultivator, General Harmon, of Monroe County, New-York, was embraced recently to obtain his views on some points of Sheep husbandry. He prefers the *Merinos*, for these general reasons, to either the South-Downs, Leicesters, or Cotswolds; and we believe he does not stand by any means alone in his opinions. What follows is the *substance* of his answers to interrogatories:—In the first place he says, that in Western New-York as to the VALUE OF THE WOOL, that Merino, washed on the sheep's back, will command 37½ cents a pound—¾ blood 5 per cent. less—and half-blood 5 per cent. less still; that South-Down Wool will command about two-thirds the price per pound of the Merino; and that the Wool of the Bakewell and Cotswold, being somewhat longer, is rather preferred to the South-Down. Then as to WEIGHT of fleece: that Merinos in his County will average about four pounds; that his lot of pure bloods averaged 4¼ pounds. From a yearling Merino ram lamb he sheared this year 10¾ pounds, and his rams a year old in May past and sheared in June, averaged six pounds. He says Cotswolds will yield a heavier average fleece than either South-Downs or Leicesters. These last he thinks will yield about the same in weight of wool as the Merinos. But he thinks the Merinos decidedly more healthy than the long-wooled sheep, as the fleeces of these last, being more open, will let in the rain and wet to the skin and give colds and consumption. Gen. H. thinks he can get, from the same quantity of grass, as much of Merino as of any other mutton, and that the Butchers tell him the Merinos lay their fat more on the inside—more on the kidneys, where it is more profitable;—in a word, that they "*open better*" than either of the other breeds. We have great respect for the General's opinions; but if any one chooses to "try conclusions" with him, we always stand open for conviction.

FIRST CAPITAL.—The sum required depends exceedingly upon very variable circumstances. The most profitable mode of farming would require the use of £8 to £12 per acre. Eng. paper.

ON THE PRESERVATION OF HEALTH.

THE GOOD EFFECTS OF FREQUENT BATHING.

With the mercury at 90 degrees of Fahrenheit, what can be more natural, than to spend a few thoughts on the means of *counteracting the ill effects of such excessive heat?* And how can this be better done than by frequent ablutions of the whole body, so that every pore may be kept open, and free passage given to matter which the system rejects and would fain throw off by perspiration. We write in the full persuasion that bathing is too generally neglected in the country—either from want of thought upon its importance, or want of convenience for its enjoyment; but with a little trouble such convenience might be provided, wherever there is a good pump, or yet better, where there is a copious spring of water. The facilities should not only be afforded, but those who have charge of families should make it a point to see that they are availed of, by every member under his control. Ask the laboring man, him who labors with mind or body, and who is accustomed to being daily, or very frequently refreshed with the shower or plunging bath, what would induce him to forego it?—Rising in the morning exhausted and languid from the effects of oppressive heat, he comes out from his bath invigorated and capable of thinking so much closer, and working with so much more alertness and satisfaction that he would much sooner relinquish one meal a day than *give up his bath!* He only who habitually enjoys it can estimate the privation when no means are to be had for the indulgence.

Those who have most studied the art of preserving health dwell upon *cleanliness of the person*, as next in importance to be considered after *air and food.*

The happiness and success of every farmer, depends so much on the health of all his household that under the most fervid heat that has been felt here for the last ten years we do not see that we could better devote the space it occupies than in giving to his perusal and reflection the following paper which seems to contain about all that need be said on the subsubject of it:

"This is not a mere matter of decency. It is one of the positive commands arising from the constituted order of things. Be it remembered, that every thing that lives, vegetable or animal, is wasting while life continues; and that all which is sent forth through the milllions of openings by the skin, has run its round, and is lifeless; and that more than half of all the food taken comes forth in this manner. If perspiration, sensible and insensible, be permitted to rest on the skin, and stop the way of that which is coming, Nature is offended, and will show that she is so. Such neglect is one of the causes of disease. This fact was probably well known to Eastern nations, since it was part of their religious dutiy to cleanse the skin. These nations were ignorant of the modern comfort of wearing a garment next the skin which can be frequently changed. The absence of this comfort was one of the causes of those dreadful diseases of which we read, and which are now unknown among Christian nations. There are classes of laborers and mechanics, whose health would be preserved, and their lives prolonged, if they knew how much depended on periodical cleansing. It may be said that there is a connexion between cleanliness and moral feeling. Perhaps it may be going too far to say, that those who habitually disregard cleanliness, and prefer to be dirty, have no moral perception: but it may be truly said, that those who are morally sensitive are the more so from respecting this virtue. There is a close affinity between moral depravity and physical degradation. The vicious poor are always shockingly filthy: the depraved rich are visited by worse penalties: they may have clean garments; but what can wash away the impurities which vice has made a part of themselves? It is not for one's self only that the virtue of cleanliness commends itself. Every one comes within the observation of others. However uncleanly one may be himself, he is not the less offended at the like neglect in those whom he observes. Now, it is every one's duty to himself to recommend himself to others, so far as he innocently and reasonably can, and to obtain their respect.—Clean and costly garments may fall very short of doing this, if it be seen that they are a covering for the neglect of this important law. If there be a lovely object to the human eye it is a clean, clear-faced, healthy, innocent, neatly-clad, happy child. There are few children who may not, if they will, be neatly dressed, for this does not depend on that of which the dress is made. There are fewer who may not have a clear skin, and healthy look, if they are properly fed, and sleep in pure air. There are none who may not have a clean skin; for we speak to those who are old enough to judge for themselves. And let it be added, for their inducement, that, in obeying the command to be clean, they are performing a moral duty; in neglecting it they are inflicting an evil on themselves in two ways—first, in diminishing their own comfort; second, in losing the esteem of others."

☞ The best mixture for filling up wounds in trees is made with cow-dung 1 bushel, old lime-rubbish ½ a bushel, wood-ashes ½ a bushel, and a little river-sand, well worked together by spade, or beaten until it is of the consistence of fresh plaster, such as is used for ceiling rooms.

THE CAUSE OF EDUCATION

AS CONNECTED WITH AGRICULTURE IN THE SOUTH.

LETTER FROM THOMAS AFFLECK, ESQ. CORRESPONDING SECRETARY OF THE NATIONAL INSTITUTE, TO THE EDITOR OF THE FARMERS' LIBRARY.

* * * * "I am desirous of having all the information possible, on the subject of the establishment, progress and present working of the Free School system of New-York and Massachusetts. We do indeed need something of the kind here; and I am in hopes that something can be done now. The first important step has been taken. A liberal and public-spirited gentleman of Natchez, Alvarez Fisk, has brought the subject directly home to the people of that city, by giving to the city a valuable property, with good and sufficient buildings upon it for extensive Free Schools, on condition that the citizens should immediately consent to the levy of a direct tax upon themselves for that purpose. At a public meeting immediately called, this was voted for almost unanimously, and a tax levied sufficient to establish and support an extensive Free School of the very highest character, which it is expected will be opened in a few days.

Those of us in favor of a general and extended system of Education, within the reach of and free to all, are now greatly encouraged to hope that the examples set by the cities of New-Orleans and Natchez, will be followed by the *States* of Louisiana and Mississippi.

The subject of Home Education is attracting much more attention within the last year than it has done for many years past. Parents begin to see the bad effects of sending their children so entirely beyond their reach, as they are when sent to Schools and Colleges in the North and West; and particularly lads of an age to receive readily impressions of idleness, and iniquity of every kind. They begin to find, too, that those young men who have received an education at Schools and Colleges near home, get a much better education than those sent abroad; and from the check kept upon them by parents and friends, almost invariably turn out better than when left to themselves. The additional support now given to our institutions of learning, enables those in charge of them to extend and improve their means of usefulness—and I venture to say, that the young of both sexes of this State can now receive a better education at home than they can by being sent a distance. Our own little town here, of Washington, has a most excellent High School, conducted by Messrs. Ammen & Rowland, (the former well known as an excellent instructor and disciplinarian, and whilom Professor of different Colleges)—and an equally excellent School for young ladies, the old, well-known Elizabeth Female Academy, now under the conduct of Mr. and Mrs. Ford and their daughters, formerly of Germantown, Pa. Both these Institutions, as also Oakland College, are in a very flourishing condition.

I am glad to see that you once more ascend the Chair Editorial, and are about to give us a new Agricultural Journal. Success attend you!"

We should hail this letter from Mr. AFFLECK with more pleasure, and with greater confidence in the prospects it bespeaks for the South, if we could be satisfied that he does not mistake his own enlightened enthusiasm for a well-rooted public sentiment, and a firm determination to *act*—for every one knows the wide difference between *doing*, and—*having a great mind to do!* How often have we heard the notes of preparation for reform, in the systems of education, and in the agricultural practices of the States South of the Delaware, yet how little has been achieved in either since the Revolution of 1776! As far back as 1692, more than one hundred and fifty years past, at a session of the Legislature of Maryland, held at the *City of St. Mary's*, an act was passed for the encouragement of education. Four years afterwards the Free School of "King William" was established at the venerable City of Annapolis, and in 1723, more than one hundred and twenty years ago, a school was erected in each of the twelve counties, into which the State was then divided, and the funds provided by previous acts, for the support of County Schools, was equally divided among them. By various acts of Assembly, schools have since been established in all the counties subsequently formed; but what have any of these schools done for imparting a knowledge of the *principles of Agriculture*, or any of the sciences, the knowledge of which is necessary to ensure to practical agriculture greater success and higher intellectual embellishment? In these schools have been taught, time out of mind, reading, writing, common arithmetic, and sometimes the *Latin* and *Greek* languages, but, what particular light have these shed on the business which was to be pursued, as a profession and for a livelihood, by four-fifths of the scholars? The mistake has been, not in any want of sensibility to the importance of common schools, so that education may be brought to every man's door, (though that has been but partially effected,) but it has consisted in not providing for the *right sort of education*.

On this subject, it would be difficult to say any thing that *we* have not urged again and again, years ago. More than twenty-four years past, it was said in the American Farmer—on the *Profession* of a Planter or Farmer, that "a

farming, planting and horticultural collection of books, should adorn, and would enrich every cultivator's mansion. An intimacy with a few such works during the five years preceding the time of lawful age, would alone be enough to make a respectable man, of honorable acquirements, out of a raw and simple youth of sixteen years. The human mind is as susceptible of being trained, quickened, strengthened and led to a right end in the great *business of the Planter and the Farmer*, as in *any other* profession in the whole round of human life. Every thing is done with more than a medium profit, which is done by *a skilful mind*, added to mere animal strength. Education not only forms the common mind; it forms those minds also which are uncommon. To be taught the habits of observation, examination, and reflection, and to attend to *causes*, consequences, effects and results, is to be a man of better sense however good the mind may have been by nature. The *Farmer or Planter ought to be that man, that master, of his art—sub arte peritus*—as well as his neighbors in other professions. Affected by the seasons and the weather, he should be a careful and judicious observer of them."

"The cold nips his productions in the germ and bud: the heat prevents their succulent nourishment: the wet occasions injurious fermentations, or retards maturity till the season is lost. The instructed and experienced farmer best applies the proper means of prevention, preservation, and cure, which the various trials of the day require from his vigilance and versatility. Warned and empowered *by knowledge*, he saves by the ability to act instantly with intelligence, while a half bred farmer loses the quality or quantity of his crop from delay to consider or inquire. From the moment when an able cultivator sets apart his fields for the several purposes of the year, till his crops are delivered to the purchasers, he is engaged in a round of observation, care, management, and an acquaintance with his profession by a regular and well governed education, must give him an incalculable advantage over an industrious but untutored neighbor in the quantity, quality, and value of his crop."

Bear in mind, my dear Sir, that these thoughts were presented to the patrons of my old American Farmer in 1821—and here, after a lapse of twenty-four years, what progress has been made in practical education in the Southern States? Is not their course of education the same now as then—the same old books and methods? Compare their products and exports—their population and general condition and prospects now with what they were then, and wherein have they advanced? Is there, then, as some would persuade us, some resistless enervating influence in the air of Southern climes that unfits men to struggle continuously, and at last turn back those adverse tides that occasionally threaten to break over the prosperity of every community?

Unmanly thought! what seasons can control,
What fancied zone can circumscribe the soul?

And here let us say, by way of parenthesis, when we speak of defective education in the South, we are not to be understood as meaning that sort of education which makes men classical scholars and orators, and passionate and powerful declaimers—we forget not and can never cease to admire her Pinkneys and her Randolphs—her Madison and her Henry. "Thoughts that breathe and words that burn" are spontaneous growths of Southern soil, nor can we too highly estimate their value, when the flame of patriotism is to be kindled, and grave Senators to be animated in the cause of liberty, by a Calhoun or a Preston, a Rives or a McDuffie, or a Berrien—but is there not a time for all things—a time and subjects for *action* as well as for speaking?

As to the causes which seem to have suddenly arrested the growth of the Southern States—the grain growing States more especially; bringing them to a stand still, as the noblest buck of the forest sinks in his tracks at the crack of a Hampton rifle—some attribute their unimproving social and pecuniary circumstances to some baleful political influence, under which labor-saving machinery has been introduced, to increase proportionably the productive capacity of the North. Prior to the great improvements in machinery for the manufacture of textile fabrics, Virginia had, probably a larger number of hand-looms at work than any equal population, but what natural facilities for manufactures does the old Bay State possess, that the Old Dominion does not enjoy? With this advantage in favor of the latter, that she might supply from her own soil, under its genial skies, what Massachusetts buys from other States of the necessaries of life, and chiefly from the South; amounting to a quantity, in the article of wheat flour, for example, to nearly, very nearly all our exports to all the world besides. Instead, then, of struggling against destiny, is it not better to control and meliorate it? And is it not of the greatest importance to all who have agricultural surpluses to sell, that their customers should be as near as possible to the place of production, lessening in that proportion the expense of transportation which is levied on the produce; for, as Mr. Stevenson has put it, with clearness and force—

"Our produce, until it reaches the market of exportation, does not change its character of interest. It is still the planter's, and only becomes an article of commerce, when it touches the hand of the merchant. The transportation, therefore, to market is as intimately connected with its value as any process of its previous preparation."

But let me not be led away, in *this* letter, from the subject of the *sort of education* best adapt-

ed to the wants and condition of Southern agriculturists; and here again, to show not only what my views are, but that they so remain after years of reflection, let me recur to the American Farmer for 1821. If I dwell more than may seem necessary on a single point, it is because I verily believe that in no other way but by a radical change in the books used and the subjects studied, and, in a great measure, in the qualification of instructors, can thorough reform and regeneration for the Southern States be brought about—we must begin by instructing those, thoroughly, in the true wants of agriculture, and the true *principles of the practice* of that art, who are to come after us, and to frame the laws and policy of these States. But first please turn back to Mr. Randall's important letter, page 44 of the July number of the Journal of Agriculture and see how, twenty-four years ago, his suggestions were shadowed forth in the following from the American Farmer of 1821; and how, as evinced by his letter, the ideas then thrown out, are *approaching their consummation in this State*, where there are now *more than eleven thousand common school districts, and more than* 650,000 *scholars*—though then there were not half that number. Shooting ahead of Virginia as one of Stevens' flying steamers passes a sloop on the Hudson, what will New York not do, when, a few years hence, their *million of scholars* come to be educated in the way, and imbued with the sort of knowledge here recommended:

"Since the happiest experience has proved that the cultivators of the earth may be as opulent and illustrious as *Washington*, let us proceed to inquire into *the means* of making us a people great in the *profession* of agriculture; intelligent in its theory, bright in its practice.

The foundation of general education is laid in the common schools of the townships, hundreds, parishes, villages, boroughs and cities.—We will denominate those schools for reading and writing *the primary schools*. From the natural equality of men, these schools must contain the same proportion of sound and strong minds as our academies, colleges and universities. In these little scenes of puerile instruction, teachers should be preferred who have a talent and knowledge in farming, fruitery and gardening. They should have a suitable *teacher's glebe*, as part of their support, and for the exercise of the industry, talents, care and management of the children. The teacher should study to instruct them in the practice, course, and *reasons* of culture. He should have *a manual of the farmer's profession*, out of which portions should be read as exercises. It would be worthy of the wisdom of the State Legislatures to offer a premium, in money, to such persons as should compose and compile *the best hand-book*, for that purpose, which should be printed in a plain, cheap volume for those schools, and for the families of planters and farmers, male and female. Women are often distinguished in gardening and fruit, and are respectable in the economy and management of a farm. Cuts or plates, exhibiting "*the mechanic powers*," the lever, the wedge, the inclined plane, the screw, the pulley, with their uses, advantages, and reasons, or principles, would be highly amusing and deeply instructive.* Competition, in little sections of the teacher's ground, as to kinds, qualities, and quantity, would have an excellent effect. Every parent or guardian would cheerfully supply his child or ward, with seed for his little section of the teacher's ground. Approved tools should be a subject of particular consideration. Whenever ground could not be obtained, or cultivated, such a book as has been mentioned, would be highly favorable in its effects upon young minds, and most so in the cases of the children of the ignorant, the unskilful, the poor and the unwise.

The neighbouring heads of families should send to the teacher a constant supply of articles on agriculture from newspapers and pamphlets, specimens of fine wool, or curious seeds, fruits, plants, engravings, tools, implements, utensils, ores of lead, iron, copper, tin, &c. clays, ochres, new improvements, processes, inventions, &c. &c. as they might fall into their hands from time to time. After securing one for himself, every planter and farmer should send one to the teacher. These two effects would be produced, the teacher and the pupils would acquire a variety of useful knowledge *pertinent to culture*, never to be forgotten, and the pupils would carry it home to their fathers and relations, and thus diffuse knowledge, and increase its activity, at least among the uneducated.

In the next class of schools above the common or primary, and below the colleges, which we call in America, *Academies;* the same means may be used to excite to agricultural instruction, reading, observation and reflection. It may be done in a more accurate, systematic and extensive manner. Dictionaries of agriculture; concise systems, Dictionaries of the branches of art and science connected with culture, may be easily and cheaply introduced. The superior professors would be warned on the subjects, by *the opening* of it, proposed in the common or primary schools, and assisted by conferences and correspondence, with the most powerful men among the practical farmers and planters of their vicinity and acquaintance. The best American and foreign writers may be consulted, and the branch of *landed culture* in our academical *economies* may be rendered delightful, ornamental, beneficial and accurately technical and sci-

* Two Indian warriors were shown a beautiful pair of compound brass pulleys, in the college of Philadelphia. Each block had perhaps a dozen sheaves, and was about as large in circumference as a common tumbler, and capable of receiving only a good silk bobbin of the thickness of a tenth of an inch.—The two stout red *children* of nature were told by the interpreter, that a little boy then before them, would force them, *by those pulleys*, to come together. Each seized one of the double blocks by the hooked metal handle, and stood at a distance from the other, of about three or four feet. The little boy began to draw the cord, and forcing the Indians to approach *by the power of the pulleys*. The Indians, with a little passion on their faces, set foot to foot against each other, and endeavored to keep apart. The child, who was instructed, pulled upon the string, and laughed archly. The Indians struggled, with violence and rage, using all the force of their arms, legs, and weight to keep apart, but to their great mortification, were brought together, with the scotched blocks of those powerful little pulleys. No pupil in the college library, no savage of a dozen there ever forgot that practical lesson upon *the power of the pulley*.

entific. Annual, quarterly, monthly or weekly discourses of teachers and exercises of pupils, happily mixed, might be practiced. A regular compendium for the exercises of the pupils, is as easy, and proper in this branch of economics, as in those relative to money in coins, money of account, commerce, government, &c. They are all embraced in the enlarged system of moral or habitual or customary or practical science of the economy and business of human life; which is strictly "*moral philosophy*" or "*moral science.*"† It must not be apprehended, that these ideas are too formally learned and scientific for the business of farming, for it is a truth, that it is the real, simple and valuable character of the present times, that the commonest things are no longer done by guess, by mere practice, fashion, custom or imitation. It is known, that there are philosophical principles and technical processes for boiling *spinach*, making *butter, cheese, soap and bread*, constructing *a spinning wheel*, or *loom*, making *maple sugar*, fermenting home-brewed *ale, cider and wine*, distilling *spirits*, as real, true and sure as the principles on which the Almighty Maker of all things has created and ordained the motions of the spheres that roll throughout the universe. *Genuine Philosophy*, in its correct sense, is the whole system of principles on which God has made, preserved, and applied every thing from the atomic dust of the balance to the stupendous luminary of the universal frame. *Our philosophy* is all we know of this immense mass of divine wisdom; and it may be safely affirmed, that *the profession of a planter or farmer* rightly understood, involves more of its *temporal* materials, than any other single pursuit in life, not even excepting that of the learned Doctor in the healing art.

It will naturally follow from what has been advanced, in regard to our common or primary schools, and more reputable academies, that *the infusion of a knowledge of the principles and arts of agriculture into the minds of the pupils in our colleges and universities arises as the next duty, and in a superior degree.* It is by means of the learned professors, the excellent books, in the routine of instruction, and the invaluable collections, which fill their libraries, that the maturing student elevated by means of the two lower schools, may search into the whole round of our subject. He may thus obtain the best modern and tried knowledge of the earth, its theorists and its operators, its cultivations, its seed, its productions, its miscarriages, its methods of prevention, support and cure, and all its scientific and technical instruments, means and auxiliaries. Here, too, the professors and the students may perform the delightful task of exemplifying all the science relative to agriculture, in the various crops of the neighbouring estates, preparing the youthful minds for the next and most important stage of their juvenile instruction.

It is now proposed to submit a proposition, which may appear new, or at least not to be yet practiced in the United States.

It appears expedient to adopt in the education of our sons for *the profession of a planter or farmer*, a measure which is common and approved in every other walk of busy life. The youthful pupil in the ministry of religion is placed by his parent or guardian, as a regular student of divinity, under some suitable established minister, of talents, learning, and virtue. The pupils of the law and in medicine are placed in similar situations, with established practitioners of talents, learning and probity. Young men intended for the profession of architects, masons and other branches of the fine and useful arts, are treated in the same judicious and faithful manner. If *the profession of the planter or farmer* is to be rendered *more profitable and distinguished for talent, improved by knowledge and experience*, it is obvious that a like measure, in the last stage of the education of the rising generation, intended for rural life, is worthy of further serious consideration."

We would proceed to enumerate the several branches of Agricultural industry, which might be pursued with increasing powers of illustration, and intellectual enjoyment, as well as with greater practical success, (embracing the pursuits of cotton and sugar planting)—after an appropriate course of scholastic preparation; and might explain more exactly in what that preparation should, in our humble judgment, consist; but that as much space has been already occupied as it would be fair to appropriate to one subject. It may be reverted to in the September number, in the hope, not so much of submitting anything new, as of enforcing by additional illustrations views already urged and which seem to be indispensably necessary to insure the common aim.

Thinking thus that so much depends on practical education, it becomes a cause in which we should never tire of being useful, if we could; for we believe it to be as true now, as it was in his day, when two hundred years ago it was quaintly written by Fuller:

"'Tis a silly conceit, that men without the dead languages, are also without understanding. It's apparent in all ages that some such have been even prodigies for ability; for it's not to be believed that Wisdom speaks to her disciples in Latin, Greek, and Hebrew."

Sure it is, it was in neither of these languages that she spoke to our WASHINGTON or FRANKLIN.

For the present you will be pleased to pass from this to page 97, in which will be presented an inkling of what science and what societies are doing for Agriculture in England. Though nothing can be more unsafe than to follow English practices in detail, without reference to obvious dissimilarities, yet the general principles of agricultural improvement are of universal applicability. J. S. S.

☞ Don't allow Rhubarb to seed if you want very fine leaves next year. The roots, if left in the ground, will require no care; if forced, it is only necessary to transfer them from the open ground to a warm and rather dark greenhouse.

† Moral science does not mean mere *ethical* or *virtuous* science; but the science of the whole system, or economy of civilized life, from the rules and operations of families and men of business in every line, to those of corporations, states, governments, and nations.

AGRICULTURAL ASSOCIATIONS AND SCIENCE.

WHAT THEY ARE DOING FOR AGRICULTURE IN ENGLAND.

THE "ROYAL AGRICULTURAL SOCIETY" of England met at the Society's House, Hanover Square, London, 21st May, 1845—Duke of Richmond, President. One of the points to which the Society's attention had been directed the last half year, was—a *chemical analysis of the ashes of plants grown on different soils, and in different localities, throughout the kingdom.*

That Society now consists of 96 life-Governors: 204 annual Governors; 495 life-Members, and 6123 annual Members, making a total of 6,933 Members. It appears from the statement of arrears that, on the 1st day of the present month, 35 Governors and 2,281 Members were in arrear of subscription, the sum amounting to £5,730; that at the General Meeting in December last the amount of such arrears stood at £6,609, a reduction of £879 having been effected during the last six months. The present amount of invested capital is £8,200—a purchase of £500 stock in the 3¼ per Cents. having been made during the last month. The current cash balance in the hands of the Society's bankers at the present time is £2,038, not including the sum of £1,000 contributed by the town of Shrewsbury, towards the expenses of the ensuing Country Meeting, and already paid over to the credit of the Society's account.

To show the grand scale on which these associations for the improvement of Agriculture are conducted, a few items may suffice.

It has been seen that the town of Shrewsbury gives $5,000 for the sake of having the ensuing County meeting held there.

"At the suggestion of the British Association for the advancement of Science, the Council have resolved that a chemical analysis of the ashes of plants, grown in different localities and on different soils throughout the kingdom, shall be made at the expense of the Society; and they have voted the sum of £350 towards carrying out that desirable and important object."

Here, then, it appears that for a chemical analysis of the ashes of plants, they appropriate near $2,000! What State in this Union, even in its corporate capacity, and out of its public treasury, would give that much to have even a complete geological survey of any one, or of every county in the State? Whereas *every county* ought to be surveyed geologically and agriculturally. Then again—

"At the request of the Stalham Farmers' Club, the Council have instructed *their consulting chemist*, Dr. Playfair, to analyze, at the expense of the Society, specimens of the soil and subsoil of a wheat-field in Norfolk, remarkable for its productiveness."

Who shall say, after this, that Agriculture has no need of the lights of science? Here they have a regular "consulting Chemist," who is probably paid four or five thousand dollars a year. True, these members of the Royal Society of Agriculture are men of immense income, but it consists also of men of distinguished ability, who, in all their proceedings, indicate a confidence that agriculture *under the application of chemical and mechanical science*, is in the full progress of successful improvement.

Look now at their list of premiums—in respect of its tendency, particularly, to excite inquiry and to insure the application of intellectual (the best of all) power to Farming concerns! In our country we are too apt to doubt whether Agriculture is to be improved by any thing but early rising and hard work; and when we do call on men whose science is the fruit of years of toilsome study, we expect them to give their time for nothing, and take reluctant thanks for pay! Sometimes, when employed by the State on a small salary to make scientific explorations, demagogues soon persuade the people, or rather their popularity-hunting representatives, that it is money thrown away. Here, in the case before us, $200 are given in many instances for a single report on the farming of a particular District. What would the Agricultural Society or even the State of Virginia give for a report on the farming practices and improvements—Grasses, Manures, Implements, Domestic Animals, Management of the Dairy, Sheep Husbandry, &c. &c. of any, the most thriving county in the United States? When we speak of Virginia, though seemingly in a tone of reproach, it is always in a spirit of (we were going to say, of overweening) affection. If we instance her, we generally mean as much, Maryland, North and South Carolina, Georgia, Alabama, and all the old grain-growing and planting States South and West of Delaware. But to return to the list of premiums awarded, look at them in the light we have already indicated! It will be seen that these do not embrace but are over and above the thousands of dollars given for best implements and animals—cheese and butter, fruit and poultry. They are all for the written results of

philosophical or practical inquiry, and observation—in a word for *exercises of the mind*, brought to bear upon the practical every-day concerns of the working Farmer.

Countless are the benefits and blessings derived, every day, by the plain, practical working man, which, without his being aware of it, and even while he is deriding the thought of it, are the legitimate fruits of scientific discoveries made by men, in many cases, who never ran a furrow or planted a seed of cotton or of corn in all their lives. But this is a theme worthy to be separately dwelt upon and illustrated when we can get time.

The Journal Committee have reported the following awards to the authors of Prize-essays, and schedule of the subjects of Prizes, amounting to £310, for the Reports and Essays of next year:

AWARDS.

The Prize of 20 sovs. [$96 80] to Mr. H. White, of Warrington, for his Essay to the Details of making Cheshire Cheese.

The Prize of 50 sov. [$242] to Mr. R. W. Corringham, of Bolham Hill, near Retford, for his Report on the Farming of Nottinghamshire.

The Prize of 50 sovs. [$242] to Mr. W. F. Karkeek, of Truro, for his Report on the Farming of Cornwall.

The Prize of 50 sov. [$242] to Mr. G. Buckland, of Benenden, for his Report on the Farming of Kent.

The Prize of 20 sovs. [$96 80] to Mr. J. Watson, jun. of Kendal, for his Essay on Reclaiming Heath-land.

The Prize of 10 sovs. [$48 40] to Mr. E. Bowly, of Cirencester, for his Essay on the Advantages of One-horse Carts.

The Prize of 20 sovs. [$96 80] to Mr. J. Grigor, of Norwich, for his Essay on Fences.

The Prize of 10 sovs. [$48 40] to Mr. G. Dobito, of Kirtling Hall, Newmarket, for his Essay on Fattening Cattle.

The Prize of 20 sovs. [$96 80] to Mr. F. W. Etheredge, of Park-street, Westminster, for his Essay on the Cheapest and best Method of Establishing a Tile-yard.

The Prize of 20 sovs. [$96 80] for an Account of the Best Experiment in Agriculture, to Mr. J. Hannam, of North Deighton, near Wetherby, for his Essay on the Theory and Application of Bone-manure.

Be it not supposed that we are holding up these Proceedings of the Royal Society, either for hopeless emulation, or invidious comparison. The object is to gratify a natural curiosity on the part of our readers, and of *our* Agricultural Societies, to see what is doing in a country where art has done so much for the plow—moreover (we confess the soft impeachment) we would commend the *quo animo* of these proceedings especially in as much as they indicate a strong persuasion among the most enlightened men in old England that mind—thought—reading—philosophical and politico-economical investigation, have something to do with, and may lead to improvements in *farming*, as well as in Law, Physics, Mechanics, Manufactures, Commerce, Ship-Building and Salt, Sugar and Iron making!!

The following is the schedule (referred to above,) of the subjects for which the next Premiums of a similar class are to be awarded:—

SCHEDULE.

	£
On the Agriculture of North Wales	50
On the Agriculture of the West Riding of Yorkshire	50
On the Agriculture of Cambridgeshire	50
On the Advantages and Disadvantages of Breaking up Grass-lands	50
On the Improvement of the Condition of the Agricultural Laborer, as far as it may be Promoted by Private Exertion, without Legislative Enactment	30
On Keeping Farm Accounts	10
On Employment by the Piece	20
On Peat-charcoal as a Manure	10
On Sulphuric Acid and Bones	10
On White Mustard	10
On St. John's Day Rye	10
On Draining Running Sands	10

"The Council have received from the Journal Committee a highly favourable opinion of the character of the Essays sent in this year to compete for the various Prizes offered by the Society."

We propose to skim, for the patrons of the Farmers' Library, the cream of these and all other Essays where the matter may be calculated to shed useful light on the path of American Husbandry.

"The Council have accepted the invitation of a public meeting, convened at Newcastle-upon-Tyne, to hold the Country Meeting for the Northern District, at that town, in the year 1846."

We are under the impression, that the Town which gains the favor of having the yearly meeting and exhibition held in it, is required to subscribe $5000. UTICA, we doubt not, will do the handsome thing, in the way of arrangements for the Fair next Autumn. We hope the State Society will employ a good proportion of the funds at its command for *best essays*, that shall best explain the *principles* of farming practices and machinery. Such practical essays as Mr. THOMAS's, published in the last number of the Farmers' Library, and such as a very able and scientific one from the polished pen of DOCTOR GARDENER, which we have been kindly permitted to peruse; are calculated to do more good than the exhibition thrice repeated of all the fat animals in New York—useful as that is in its way. May we hope for the influence of the new "State Agricultural Society of Virginia," in the 'establishment of *local societies* for the discussion of Agricultural subjects" as has happened under the auspices of the National Society in England?

At the meeting here referred to, the Secretary, whose official conduct was on all sides applauded, offered his resignation on the ground that his *two thousand dollar salary was inadequate!*

"The Council, in conclusion, have the satisfaction, at the close of the 7th year of the establishment ot the Society, of congratulating the

members on the steady advance of the Society in the accomplishment of its various practical objects, and the gradual development of its prospects and resources: among which the Council cannot help alluding to the establishment of local societies for the discussion of agricultural subjects, which they feel have mainly originated from the attention which the exertions of this Society have attracted to the improvement of agriculture, and which the Council are confident will lead to the most beneficial results."

We will see in the September number what is doing, in the same spirit, in SCOTLAND.

DRAINING TILE.

WITH commendable vigilance and attention to the wants of Agriculture, and the various expedients and inventions to supply them, the New-York State Agricultural Society has offered a medal for the "*Best sample of drain-tile.*" This justifies the presumption, that under certain circumstances, that article may be profitably employed in our country, and thus the whole economy of the question is opened for the consideration of those who may desire to avail themselves of it, in conducting one of the most important processes to which a farmer can have recourse, for augmenting the productiveness of his estate. The more important and worthy of being employed, when the farmer can possibly command the labor and the means of carrying it out, because, generally, it would be made instrumental in giving activity to the very portions of his farm, which, but for their superfluous moisture, would be the most productive—not only the most productive, as respects actual fertility, but *profitable*, as it prepares such portions to yield crops of a kind that demand the least amount of labor to husband them.

As in some measure illustrating a subject which seems thus to have attracted the countenance of the best organized and efficient society in the Union, we have chosen the following from the last number received of the Journal of the Royal Agricultural Society of England.

This is one of those cases not to be much, if at all, affected by obvious and admitted difference of climate; the propriety of the measure depending rather on general principles: in a word, to be regarded merely as a question of means and end—of profit and loss. We give a cut of the machine, such as we find it in a late number of the London Agricultural Gazette, where the advertiser refers to the communication here inserted. It will take an eye of quicker perception of the principles of machinery than ours, to understand the construction of this one; but it was deemed best to give it such as it is, along with what follows:

ON THE CHEAPEST METHOD OF MAKING AND BURNING DRAINING TILES.

To the Earl Spencer:

MY LORD,—The active interest you have so long taken in every thing connected with British Agriculture, induces me to address to you the following communication on the subject of making and burning draining tiles, of whatever form, in the readiest and cheapest manner.

My attention has been very forcibly drawn to this subject by the high prices demanded by the manufacturers of these indispensable instruments of agricultural improvement, prices indeed so high, that even without the expense of carriage, they must have the effect of confining within comparatively very narrow limits their adoption.

It is true that the application of machinery to the producing of draining tiles, promised, and in some degree effected a reduction in the price of tiles previously made by hand, but owing to the mistaken views of those who worked these inventions, in fancying they could secure a monopoly of machine-made tiles, in requiring a seignorage on tiles made by their machines, and in the high cost of those machines, they offered the tiles to the public at so high a price that it soon became evident, if draining tiles were to be used to the extent required throughout the United Kingdom, that some other machinery of a less costly description, with equal, if not greater powers of production, and with unfettered liberty of using it, would be discovered—and this result has accordingly taken place. Two machines, worked by hand, have been discovered in the course of this year, viz. "Clayton's Machine," which is a fixture wherever set up, and for which a patent has been taken out; the other called "Hatcher's Machine," easily moveable, and manufactured and sold by Messrs. Cottam and Hallen, Winsley-street, London. The latter machine is the invention of Mr. John Hatcher, brick and tile maker and potter, living in the parish of Benenden, in Kent, where I reside, and is the one I have adopted; and all the subsequent calculations and quantities are made in reference to the producing power of that machine. I beg to assure you that, as my sole object is to put the public in possession of the readiest and cheapest way of obtaining these tiles, if any other machine as yet discovered could make them better and cheaper, I should instantly adopt it, as I certainly shall if any such be hereafter invented; and it is quite certain that the public will apply the only real test of merit to these machines in determining their choice of one, viz., the cheapest rate at which tiles can be produced by them, taking into account the price of the machine, the amount of labor necessary to work it, the goodness and the quantity of tiles it can produce in the day, and the simplicity of its construction.

Being fully aware that Hatcher's machine was not excelled by any other yet discovered in all these essential points, and therefore assuming that machinery had accomplished much, if

not all that could reasonably be expected from it, I still felt that the heavy expense of erecting kilns, as they are now constructed, together with the necessary sheds and other buildings incidental to a regular brick and tile yard, required so large an outlay, that the price of draining tiles would still continue too high for universal use, notwithstanding every improvement in the mechanical production of them. To this difficulty another must be added, no less serious, in attempting to reduce the price of tiles, viz. the expense of carriage of an article so bulky. Every one must be aware that beyond a certain distance from every brick and tile manufactory (unless it stands on the bank of some navigable water,) the expense of carriage of tiles will impose the limit of their application to land drainage. What, then, is to become of those immense districts in the United Kingdom that are so situated? It will not much reduce the evil to incur all the heavy expenses of erecting kilns, sheds, &c. &c. after the usual manner; for interest on capital embarked in the business, together with rent, must be added to the cost of making them; and after all, *if the object be to make draining tiles only*, it is obvious that these buildings of a permanent and expensive character will become useless, whenever the circle around them is furnished with tiles, the extent of that circle being always determined by the expense of carriage beyond it.

Reflecting on these obstacles to universal drainage, where required, I conferred with Mr. John Hatcher on the possibility of erecting a kiln of common clay, that would be effectual for burning these tiles, and of cheap construction—and the result was the building one in my brick-yard in July last, and the constant use of it until the wet weather at the commencement of this winter compelled its discontinuance, but not until it had burnt nearly 80,000 excellent tiles; and in the ensuing spring it will be again in regular use.

I shall now proceed to take in order the six points enumerated under the 9th head of the Prize Essays for 1845, as printed in the last volume of the Royal Ag. Society's Journal, viz.:—

1st. Mode of working clay according to its quality.
2d. Machine for making tiles.
3d. Sheds for drying tiles.
4th. Construction of kiln.
5th. Cost of forming the establishment.
6th. Cost of tiles when ready for sale.

1st Point. Working the clay.

All clay intended for working next season must be dug in the winter, and the earlier the better, so as to expose it as much as possible to frost and snow. Care must be taken if there are small stones in it, to dig it in small spits, and cast out the stones as much as possible, and also to well mix the top and bottom of the bed of clay together. It is almost impossible to give minute directions as to mixing clay with loam, or with marl when necessary, for the better working it afterwards, as the difference of the clays in purity and tenacity is such as to require distinct management in this respect in various localities; but all the clay dug for tile-making will require to be wheeled to the place where the pug-mill is to work it; it must be there well turned and mixed in the spring, and properly wetted, and finally spatted down and smoothed by the spade, and the whole heap well covered with litter to keep it moist and fit for use through the ensuing season of tile-making.

2d Point. Machine for making tiles.

For the reasons already alluded to, I prefer Hatcher's machine. Its simplicity of construction, and the small amount of hand-labor required to work it, would alone recommend it; for one man and three boys will turn out nearly 11,000 pipe tiles of one-inch bore in a day of ten hours, and so in proportion for pipes of a larger diameter; but it has the great advantage of being moveable, and those who work it draw it along the shed in which the tiles are deposited for drying previously to their being burnt: thus each tile is handled only once, for it is taken off the machine by the little boys, who stand on each side, and at once placed in rows on either side of the drying shed; thus rendering the use of shelves in the sheds wholly unnecessary, for the tiles soon acquire a solidity to bear row upon row of tiles till they reach the roof of the sheds on either side; and they dry without warping or losing their shape in any way.

The price of the machine is £25; and it may be proper to add, that the machine makes the very best roofing-tiles that can be made, and at less than half the price of those made by hand, as well as being much lighter, and closer, and straighter, in consequence of the pressure through the die.

It is necessary, in order to ensure the due mixing of the clay, as well as to form it into the exact shape to fill the cylinders of the machine, to have a pug-mill. Messrs Cottam and Hallen make these also, and charge £10 for them.—This mill must be worked by a horse; in general one day's work at the mill will furnish rather more prepared clay than the machine will turn into tiles in two days.

3d Point. Sheds for drying.

The sheds necessary for this system of tile-making will be of a temporary kind: strong hurdles pitched firmly in the ground in two parallel straight lines, 7 feet apart, will form the sides of the sheds, and the roof will be formed also of hurdles placed endways and tied together at the top, as well as to the upper slit of the hurdle, with strong tarred twine, forming the ridge of the roof exactly over the middle of the shed. They must then be lightly thatched with straw or heath, and the sharpness of this roof will effectually protect the tiles from rain. Two of these sheds, each 110 feet long, will keep one of the kilns hereafter described in full work.

N. B.—These sheds should be so built as to have one end close to the pug-mill and the clay-heap, only leaving just room for the horse to work the mill, and the other end near the kiln. Attention to this matter saves future labor, and therefore money.

4th Point. Construction of kilns.

The form of the clay-kiln is circular; 11 feet in diameter, and 7 feet high. It is wholly built of damp earth, rammed firmly together, and plastered inside and out with loam. The earth to form the walls is dug out round the base, leaving a circular trench about 4 feet wide and as many deep, into which the fire-holes of the kiln open. If wood be the fuel used, three fire-holes are sufficient; if coal, four will be needed. About 1200 common bricks are wanted to build these fire-holes and flues: if coal is used, rather fewer bricks will be wanted, but then some iron bars are necessary—six bars to each fire-hole.

The earthen walls are 4 feet thick at the floor

of the kiln, are 7 feet high, and tapering to the thickness of 2 feet at the top; this will determine the slope of the exterior face of the kiln. The inside of the wall is carried up perpendicularly, and the loam plastering inside becomes, after the first burning, like a brick wall. The kiln may be safely erected in March, or whenever the danger of injury from frost is over.—After the summer use of it, it must be protected by faggots of litter against the wet and the frost of winter. A kiln of these dimensions will contain

47,000	1	inch bore pipe tiles.
32,500	1¼	" "
20,000	1½	" "
12,000	2¼	" "

and the last-mentioned size will hold the same number of the inch-pipes inside of them, making, therefore, 24,800 of both sizes. In good weather this kiln can be filled, burnt and discharged once every fortnight; and 15 kilns may be obtained in a good season, producing—

705,000	1	inch pipe tiles;
Or, 487,500	1¼	" "
Or, 300,000	1½	" "

and so on in proportion for other sizes.

N. B. If a kiln of larger diameter be built, there must be more fire-holes, and additional shed room.

5th Point. Cost of forming the establishment. The price charged by Messrs. Cottam and Hallen for the machine, with its complement of dies, is £25
Price of pug-mill 10
Cost of erecting kiln 5
Cost of sheds, straw 10
Total £50

The latter item presumes that the farmer has hurdles of his own.

6th Point. Cost of tiles when ready for sale.

As this must necessarily vary with the cost of fuel, rate of wages, easy or difficult clay for working or other local peculiarities, I can only give the cost of tiles as I have ascertained it here according to our charges for fuel, wages, &c. &c. Our clay is strong, and has a mixture of stones in it, but the machine is adapted for working any clay when properly prepared.

It requires 2 tons 5 cwt. of good coals to burn the above kiln full of tiles. Coals are charged here at 28s. per ton, or 1,000 brush faggots will effect the same purpose, and cost the same money; of course some clays require more burning than others; the stronger the clay the less fuel required.

The cost of making, the sale prices, and number of each sort that a wagon with 4 horses will carry, are as follows:

	Cost. s. d.		Sale Price. s.	Wagon holds
1 inch pipe tiles	4 9	per 1,000	12	8,000
1¼ "	6 0	"	14	7,000
1½ "	8 0	"	16	5,000
2¼ "	10 0	"	20	3,500
2½ "	12 0	"	24	3,000
Elliptical tiles			24	2,000
Soles			10	

All these tiles exceed a foot in length when burnt

The cost price alone of making draining tiles will be the charge to every person making his *own* tiles for his *own* use. If he sell them, a higher price must, of course, be demanded to allow for some profit, for credit more or less long, for bad debts, goods unsold, &c. &c.; but he who makes his own saves all expense of carriage, and, as his outlay will not exceed £50, the interest on that sum is too trifling to be regarded, and he has no additional rent to pay; and after he has made as many tiles as he wanted, his machine and pug-mill will be as good as ever with reasonable care, and will fetch their value.

I fear that no drawing could be made that would ensure a person erecting one of these kilns by it from the chance of failure; and I do not know any way by which these kilns can be erected, and the mode of using them taught, so as to obviate disappointment, except by Mr. Hatcher being engaged to erect one or two in a county, which will serve as models.

It will not be improper to put those who may adopt any machine for tile-making upon their guard against the prejudices of tile-makers. The necessity and the demand for draining tiles has infinitely outstripped the possibility of the supply being furnished by hand-work alone in the old way: but as the services of every man who has been used to this work will be more than ever needed, the employer will find his account in securing them for the working of his machine by giving liberal wages, and by convincing the men that their earnings by work, not so laborious, but more effective, will be at least equal, and they will soon really be greater than they obtained from their former occupation.

I hope that this paper will prove the means of saving a large expenditure on buildings of a permanent character, where *draining tiles only* are wanted to be made; as such buildings, under such circumstances, will become useless when they have supplied the district immediately around them: for land once thoroughly drained with tiles, and on true principles, is, generally speaking, drained for ever.

With sincere regard I remain, my Lord
Very truly yours, THOS. LAW HODGES.
Hemsted, Kent, Dec. 18, 1844.

NOTE BY MR. PUSEY.

If Mr. Hodges should succeed in rendering the making of draining-tiles a domestic manufacture, he will have set the seal to their cheapness, and thereby conferred a great boon on Farmers. As there is no point in which our Society has been more successful than in reducing the cost of drainage, we may take this occasion of looking back to what we have done.

In the first Number of our Journal, published in 1839, I find the following passage:—"The expense (of thorough-draining) is estimated from £3 to £12 per acre, according to the frequency of their application." The price in my own neighborhood and in the Isle of Wight was then 60s. per 1,000 for tiles, and 30s. for soles, being 90s. for every 1,000 feet of materials.

In 1841, we discovered that Mr. Beart in Huntingdonshire was selling tiles of about the same size for 22s. and the soles for about 10s. being 32s. for every 1000 feet of materials.

In 1843 we found that pipes of various shapes were sold in Suffolk and Kent at 20s. per 1000, being 20s. for every 1000 feet of materials.

I was thus enabled in May, 1843 to give the following reduced estimate for draining an acre of land:—

Distance between Drains.	Pipes.			Total Expenses.		
Feet.	£	s	d.	£.	s.	d.
66	0	13	4	1	0	0
44	1	0	0	1	10	0
33	1	6	8	2	0	0
22	2	0	0	3	0	0
16½	2	13	4	4	0	0

Our engineer, Mr. Parkes, has since examined the subject of pipe-drainage most minutely. He has proved that in theory an inch-pipe can discharge the heaviest rains from the land, and he has gone far to show their efficacy in practice. Mr. Parkes, in his Report on the Implements shown at Southampton, announces that such pipes are actually now selling in the Isle of Wight for 12s. per 1000. I may, therefore, after so short an interval again have the pleasure of laying before the Society further reduced estimates of the price of drainage. The most convenient measure is, I think, the furlong, because that is the old dimension in length of an acre, the width being 66 feet; and if the cost of one drain for that width be known, it is easy, of course, to calculate for nearer distances. A furlong, too, is equal to 40 poles, a common length in calculation for the digging of drains.

Cost of Thorough-draining one Acre.

Distance between Drains.	Length of Drains in Furlongs.	Feet of Pipes.	Cost of Pipes.	Forming Drains 30 in. deep.	Total cost.		
Feet.			s.	s.	d.	£.	s.	d.
66	1	660	8	8	0	0	16	0
44	1½	990	12	12	0	1	4	0
33	2	1320	16	16	0	1	12	0
22	3	1980	24	24	0	2	8	0
16½	4	2640	36	36	0	3	12	0

A trifling addition must be made for main-drains. In laying down the pipes we should look to those counties where draining was invented, and has been practised most largely. I mean our Eastern Counties, Essex, Suffolk, Norfolk, Herts. &c. For, as Mr. Copinger Hill* informs us, "On the heavy lands of Suffolk and the adjoining counties under-draining at a distance of 16½ feet and a depth of 26 or 30 inches *is as much a matter of routine as hedging and ditching.*" Now the usual shape of drains there is extremely narrow at bottom, tapering down from a width of 4 to that of 2 inches, as shown in the drawing given by him, and here repeated.

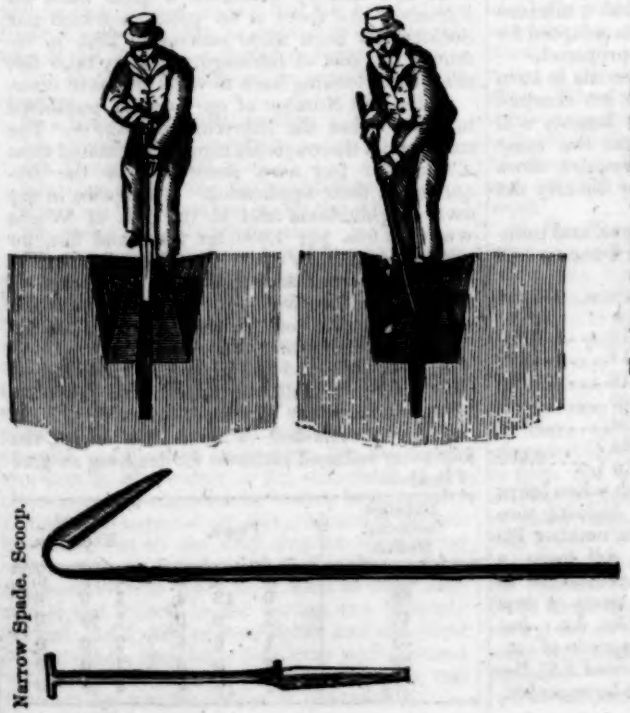
It so happens that this old and approved shape from the birth-place of thorough-draining is precisely adapted to our most modern improvement, the small pipe. The Essex tools which have been for some time employed by my workmen, were found by them last winter equally adapted, at least in very strong clay, for pipe as for thorn-draining. They are the old-fashioned narrow spade and the scoop. With this narrow spade three cuts are made, two on the sides of the cut, and one across; but in clays perfectly free from stones, I believe that the bitting tool mentioned by Mr. Arkell in his Prize Essay on Drainage is even better. I will only add that if Mr. Hodges's temporary kilns and sheds should enable the farmer to make inch-tiles at 4s. 9d. per 1000, the estimates for draining an acre must be further reduced as follows: on clay-lands without stones:

Distance between Drains.	Length of Drains in Furlongs.	Feet of Pipes.	Cost of Pipes.	Forming Drains.	Total cost per Acre.		
Feet.			s.	d.	s.	£.	s.	d.
66	1	660	3	2	8	0	11	2
44	1½	990	4	9	12	0	16	9
33	2	1320	6	4	16	1	2	4
22	3	1980	9	6	24	1	13	6
16½	4	2640	12	8	48	3	0	8

The ordinary distances may be taken at 33 and 22 feet, giving the length of drains 2 or 3 furlongs per acre. If land can be thus permanently drained for little more than a pound or a guinea and a half per acre, and if the closest drainage that can probably be required may be done for three pounds per acre, there will really be no longer any excuse for an undrained field in any part of the country.

PH. PUSEY.

*Society's Journal. Vol. iv. p. 26.



Narrow Spade. Scoop.

Hatcher's Bennenden Tile Machine.

LIME AS A FERTILIZER.

THE use of Lime in building, is of the earliest antiquity, but for the purpose of manure, the use of it has been confined to Europe and North America; that employment of it never having been thought of in Asia or Africa, though the substance itself is every where is to be found.

In this country, the application of Lime to land has greatly increased, within the present century. An impression of its durability over other fertilizers, has contributed much, no doubt, to its popularity; yet while the use of it is extending, the question as to its mode of action, has not been definitively settled. On that point much difference of opinion exists, as there does also, about the *modus operandi* of Sulphate of Lime, or Plaster of Paris—some maintaining them to be manures in themselves, entering into the composition of the plants, while others believe that they contribute—especially Lime—to the decomposition of the vegetable matter it finds in the soil; preparing it to afford food and sustenance to the growing crop.

Those who contend that Plaster of Paris acts its part, by drawing moisture from the atmosphere, are required to say why it does not thus benefit vegetation by drawing moisture from the atmosphere, as well in one region of country as another. Yet it is well known that so great is the difference of its action in that respect—so inert is it in one country and so powerful in another, that nothing is more common, when a landholder offers to sell his estate, than for him to be asked, first of all—"*Is yours plaster land?*" And this is easily understood, since it is well known, that where plaster or sulphate of lime will act, as it does on the old soft yellow looking, broom-sedge lands of Calvert, Prince Georges, and Anne Arundel counties, in Maryland, no fertilizer, natural or artificial, vegetable, animal, or mineral, is to be compared with it, in point of cheapness and efficacy, up to that degree of melioration which results in a heavy crop of red clover; and which reaches to, if it does not *end* with, the production of about eight barrels (40 bushels) of Indian corn, or one thousand pounds of tobacco. As it is with Lime, so it is with Plaster of Paris, the first application is attended with the most obvious effects; but this may be because there is then the greatest room for improvement; and consequently the effects are more visible. But the question has been raised, whether applications of plaster, however often repeated, will do more than (and that by means of the grass crops, especially clover, it secures) keep the land to that moderate point of productiveness, ever after, which is the result of the first clover crop that follows the use of it. We say moderate productiveness, because, surely every farmer is bound to esteem forty bushels of corn as very moderate, in the face of so much testimony to prove that eighty bushels have been frequently, and sometimes one hundred, gathered from an acre.

The evidences of the power of Lime to carry up the produce of land to a much higher measure, and to maintain it there much longer, than other manures most in use, have as before said, greatly contributed to extend the use of it.

Observation of its great potency, especially in Pennsylvania, among a people slow to be moved, and not liable to be wheedled in practical matters, has caused much inquiry to be made as to the *mode of using it* most common in that country, and much, accordingly, has been written on the subject. The agricultural journals abound in descriptions of the *practice* of liming, and with speculations as to the proper *time* and *quantity* to be applied; and in what reference, direct or remote, to other manures, and to particular crops.

The point in regard to which we apprehend hurtful mistake is most likely to occur, is, as to *the state in which it should be applied:* that is, how soon from the kiln, and what treatment it should undergo in the meantime; how much or how little should it be purposely exposed to wet or rain or dew, or to be left in a condition to draw moisture from the atmosphere.

As to the season of the year, the answer related by Doctor DARLINGTON, of West Chester, Pennsylvania, a writer to whom Agricultural Science is so much indebted, as having been given by a Dutch farmer, probably comprehends all that need be said: "Never mind," was his reply; "when—so you *get it on your land!*"

But the time is not now, however lately it may have been, when farmers of the first order of intelligence will be satisfied with knowing the mere mechanical routine of time and quantity. An impulse has been given to the mind—its faculty of curiosity, the mother of knowledge, has been excited, and men who were content to know *how much* will do, now demand to know *the way in which it works.* Tell us, say they, *how it acts,* and we shall better understand all the details of practice, and be better prepared in case of disappointment, in a particular case, to ferret out the reasons of the failure, and to

guard against its recurrence. Without this knowledge of the mode—the philosophy of its action; we shall be ever liable to mistakes; and besides, says the agriculturist of the new school, there is neither satisfaction nor honor, even in success, which, as far as the farmer is concerned, he has not much more agency in securing, intellectually speaking, than the man he hires, or the horse he drives.

Hence it is, that the newly-awakened spirit of inquiry is busy to find out the true science of all things that come within the compass of the farmer's calling. The true theory of the rise and recession of the sap—the birth and strange metamorphoses of insects—the physiology or laws of animal and vegetable life—and of the nature and action of manures—and first of all, perhaps, of *Lime*.

Is it not apparent that when that point comes to be clearly settled, it may be used with greater judgment and confidence, and with so much the less chance of abortion? For example, if its mode of action is only to convert vegetable substances present in the land from one condition, useless as food for plants, into another which may form for them their most nutritious food, does it not follow that it would be a profitless waste of lime to bestow it where there was obviously no such vegetable substance to be acted upon? But, without further preliminary, we proceed now to give an essay, at hand, on the use of Lime.

What we have here written is not only as an introduction to this essay, but once for all to advertise the reader, that when other dissertations on the same subject, presenting other views, find a place in the Farmers' Library, it will be under promptings, and with motives such as have been here explained.

The more than 100 pages, appropriated monthly, by the publishers of this journal, will afford us ample space "and verge enough" to spread before the intelligent reader the various theories contended for, where investigation has not removed all doubt, and we deem it but fair to afford him a view of the several facts and opinions upon which he may exercise his own judgment, and form his own conclusion.

In the September number, we shall give another dissertation, presenting additional, or other views.

ON THE ACTION AND USES OF LIME IN AGRICULTURE, AND THE MOST EFFICIENT AND ECONOMICAL MODES OF APPLYING IT TO THE SOIL.

By James Anderson, Esq. of Gorthleck, Inverness-shire. [Premium. 10 Sovereigns.]

The action of lime in agriculture depends much on the state in which it is applied to soils, whether pure as an oxide of calcium, or combined with an acid, and then, chemically speaking, a salt of lime, and likewise on the condition and composition of the soil in various respects at the time of its application.

The lime of agriculture is principally derived from large deposits of native carbonate, (lime stone,) and, in this form, it is found in frequent and very considerable quantity among the various geological formations. The sulphate of lime (plaster of Paris) is also found in very considerable quantity in Germany, including Austria, France, Switzerland, Spain, the American States, the Peninsula of Nova Scotia, and New Brunswick, in our own country, and elsewhere, abundantly. However, the sulphate is not in Britain yet applied directly to the soil so extensively as in America and other countries; it exists in vegetable ashes, and is sometimes so applied in this country, particularly to the leguminous crops, as the clovers, with very beneficial effects. In Holland, the utmost confidence is placed, and with apparent good reason, in the restorative and fertilizing powers of the ashes of bituminous peat.

Phosphate of lime, another salt or acid compound of this substance, is applied in bone manure, being the principal mineral integrant in their composition; and it is also supplied to the soil by the application and decomposition of the vegetable fibres and animal substances which find their way into the fructifying mass of the farm-yard manure heap. It occurs in nature in veins and beds in connection with tin and iron ores, and is found in masses in Britain in Devonshire and Cornwall—and in at least one locality in Spain, besides in Saxony and Bohemia, and elsewhere. This substance would be well worth a fair trial in various soils, and we have every reason to think, from experiments on a small scale, it might prove a valuable manure.

The principal supply of lime, however, for agricultural purposes is derived from the application of strong heat to the native carbonate, which expels the carbonic acid, and in this state it is carried to the surface over which it is to be applied, where it is slaked with water, with which it readily combines, being at the same time reduced to a fine powder, the most convenient form for its application to the soil.

When pure, before uniting with water, carbonic or other acid, it is known under the familiar appellation of quick-lime. Applied in this state to soils containing organic substances, it enters into union with these substances and forms compounds which are partially soluble in water. All organic substances contain abundantly carbonaceous matter and oxygen, and, by attracting these, the quick-lime is gradually converted into a carbonate. But in practice the quick-lime is generally slaked with water before it is applied to the soil, in order to reduce it to a powder; and it is thus more equally divided in the process of scattering it over the surface. When slaked, or in union with water, it is chemically styled a hydrate, and operates in the same way as quick-lime in reducing or combining with organic substances. It retains no longer the same action; but, on the contrary, operates powerfully in preventing the too rapid decomposition of organic substances already in a state of solution or approaching to it.

Having stated generally, in a few words, the action of quick-lime and hydrate, and carbonate or mild lime, we shall reserve the details of the most efficient and economical modes of application to be specified and explained as they may naturally suggest themselves in our progress.

1. We have to consider the most suitable

period in the rotation for the application of lime.

With a view to economy and efficiency both, this must be when the land is preparing for a fallow or fallow crops. It should always in this case be applied as a hydrate. At this time an opportunity is offered, when the land is in progress of tillage at any rate, of intermixing and thoroughly incorporating the lime with the soil, when it immediately acts, as before stated, upon any insoluble organic substances which it may contain; and, instead of remaining dormant, inactive, and useless, as these substances had been during the previous rotation, they gradually form combinations with the lime, which become partially soluble in water, and thus, when lime is judiciously applied to a fallow, it is one reason for a smaller quantity of manure sufficing. This, of course, will only happen when there has been an accumulation of fibrous and insoluble organic matter in the soil, which is always the case in newly improved land, and where the soil, though in cultivation, has never previously undergone liming, and more particularly if it contains in itself little native calcareous matter.

With regard to the crops to which lime is found most beneficial, we shall begin with the *Cerealia*, and of these we shall speak to wheat, barley, and oats. We know, in innumerable instances, that wheat is grown on soils previously incapable of yielding an abundant or remunerating crop. We do not doubt that this is partly owing to the previous operation of efficient draining, as the most ignorant agriculturist is now aware of the fact, that the application of manures, organic or inorganic, is comparatively fruitless without attention to draining, as a preparative, in the first instance.

From the previous application of lime to a fallow, we see a very moderate allowance of manure— consisting either of bones, themselves containing a large proportion of phosphate of lime—and various combinations of decaying organic substances, produce an admirable crop of turnip, and thus prepare the way for a rich and luxuriant crop of barley, and this, too, on soils that ranged formerly very low indeed in the scale of fertility, but have been quickened into life and productiveness by the presence of this new agent. We have seen also a very superior crop of barley frequently produced on barren moorland, by the simple application of lime, and with a very little addition indeed of in-nutritious and ill-prepared manure in our own island, at an elevation of 800 or 900 feet, and between latitude 57° and 58°, and this too on a soil, to say the most for it, of average barrenness.

As to the oat crop, in the rotation, we have not observed that it is by any means proportionally so much improved by the application of lime. But this may be accounted for by the great exhaustion of manure caused by the luxuriance of previous barley crops. In high and cold localities, where oats are cultivated as the principal grain crop for winter fodder, and the lime applied and harrowed in above the plowed natural lea, the effect on the crop has been very beneficially apparent, particularly and chiefly where the land had been well drained before the application of the lime. The improvement in the succeeding pasture-grass was, if possible, still more remarkable and lasting. This is easily accounted for when we consider that the cold in this country, at considerable hights, and the consequent low natural temperature of the contained water in the soil, together tend to retard the decomposition of any portion of the fibre of the growing natural herbage that may be left unconsumed on the surface. But when lime is applied, it immediately dissolves this fibrous deposit, which has been, from the above causes, unceasingly accumulating, and converts it into wholesome and abundant nourishment for a higher and more useful class of plants. At great hights, then, and in cold localities generally, the effects of lime are particularly striking, and also very lasting, after draining.

Of the *Leguminous* crops, we may say unhesitatingly, from what we have observed, that they cannot be cultivated with any success without the previous application of lime, unless where abundance of native calcareous matter exists in the soil. The bean, indeed, and, so far as we have observed, the potato crop, are exceptions to this rule; although we have seen lime, in compost with earth or old turf dykes, give a most productive and valuable crop of potatoes.

Whether spread on the surface of pasture-land alone, or in compost with earth, or applied with a crop and grass seeds, with a view to pasture, it never fails to call into existence the dormant seeds of the superior grasses in the soil, and to nourish and facilitate the growth of those that may have been confided to it by the agriculturist. This is a fact placed beyond all dispute. It is a never-failing fertilizer of grass land.

2. The effects of lime on peaty soils are the following:—

Peat is known to contain two substances inimical to vegetation, and eminently preventive of the changes and interchanges, the decompositions and recompositions, necessary to afford a supply of genial nourishment to a superior class of vegetables. These injurious substances are tannin and gallic acid. But let us consider for a moment the composition of these inimical compounds, and we shall find that we have it in our power, by a simple process, to convert them into substances most friendly to the advancement of superior vegetation, and in this form contributing highly to the fertility of soils. We find on analysis that they are composed of the following constituent proportions:—

	Carbon.	Hydrogen.	Oxygen.
Tannin,.....	52.59	3.825	43.583
Gallic Acid,....	56.64	5.00	38.36

We have shown in the first part of this essay, that quick-lime and hydrate have a powerful affinity for carbonaceous matter and oxygen. This known, with the assistance of the above analysis, it is at once clear how they operate beneficially on peaty soils. It is evident that, by appropriating a portion of the carbon and oxygen, the lime neutralizes the acid in both these substances, itself becoming a carbonate; and, by this change, substances that were formerly destructive to fertility, combining in part with the lime, are resolved into their simple elements, and, assuming a new character, gradually become capable of sustaining an improved vegetation. Of course, as we have already shown, the lime will act on the fibrous vegetable remains in the soil, combine with them, and convert them by degrees into soluble and fructifying nutriment for vegetables. If, after peaty lands have been once limed, it should be found advisable, for any cause, to break up a lea, (and this should be as seldom as possible, such lands being better laid to grass,) it would be an improvement

to do so by paring and burning, as, by the application of heat, a portion of the lime, now converted into carbonate, from being so long buried and in close contact with the soil, would be freed from its acquired acid, and restored anew to its original state of purity when first applied —or, in other words, be reconverted into quick-lime— and would thus be rendered capable of exerting a renewed action on the peaty substances present, and, from its recovered causticity, again promote the various processes of decomposition and recomposition so favorable to the development of healthful and luxuriant vegetation.

3. The action of lime on clayey or aluminous soils is as follows:—

It operates both in the fertilization and comminution of clayey soils. From the minuteness of its particles, they easily insinuate themselves into the clay. On the particles of lime, too, encountering any enclosed organic matter in these aluminous masses a strong action immediately takes place between the lime and such matter, which, by combining with, disorganizing, and reducing such organic matter, destroys the continuous solidity of the clay which contained it; and from this, with the evolution of the gases and other attendant action, the stubborn clay at length becomes cellular.

4. In sandy soils, lime operates beneficially as follows:—

It is well known that sand (silica) differs much from clay (alumina) and lime, in two important characteristics particularly. Both lime and alumina have a great affinity for organic matter and moisture, and retain both these substances by a powerful attraction; sand has no such affinity, and on this depends its barrenness. It is merely commingled with organic matter at any time, never chemically combining with it in any quantity, and retaining it by no degree of attraction whatever, in this way it offers no resistance to the rapid escape of such substances by combinations with the components of moisture deposited by the atmosphere and the constituents of the atmosphere itself; and the fructifying properties of the manures are thus quickly withdrawn from the soil, and escape from it, in the aërial form, into the atmosphere. Besides this, they are washed away, in part, by heavy rains and superabundant moisture, beyond the reach of the root fibres of the crop they were intended to nourish. To cure these defects, lime is applied. From its affinity for moisture, it attracts it from the atmosphere, and, when voluntarily discharged from this source, promotes its retention in the body of the soil. By combining with any organic manures that may be added to the soil, it prevents their wasteful and too rapid escape; and thus, by rendering the soil more retentive of moisture and organic substances, and improving its texture and consistence, eminently promotes and increases its fertility.

After the explanation we have just given, it is difficult to see how lime can be dispensed with in the improvement and perfecting of any soil, unless that soil should be naturally calcareous. Such a soil effervesces powerfully with acids, and is thus easily detected by the most untutored inquirer. The only case in which we found lime to produce no great sensible or perceptible beneficial effect, or very little, was when superabundant moisture existed. But, even where the soil had been previously exhausted by overcropping and bad cleaning, we have found quick-lime, by destroying insects and their larvæ, and the seeds and roots of noxious and unprofitable plants, and by converting these, as already explained, into wholesome nutriment for succeeding crops, a most useful coadjutor, in connection with a well-conducted fallow, in restoring vigor and energy to the most exhausted subject. Where former injudicious applications of lime had been made, we can recommend no efficient restorative but a copious supply of organic manure and rest in grass.

One instance of abuse of lime we may particularly notice here. Thirty years ago and upwards, lime, at the rate of 200 bushels of hot shells an acre, was spread on between 100 and 200 acres of very light siliceous, open, dry, gravelly soil, scarcely 200 feet above the level of the sea, and within a mile of the coast, between lat. 57° and 58°, in north Britain, and being treated rather sparingly on some occasions, in after cropping, as to manure, till within the last eight years, though correctly farmed by the rotation of turnip, barley, and hay seeds, and hay followed by pasture for one year, and sometimes two years, it has not and will not recover this overdose for a long time to come.

Although the soil was poor, the lime, being new to it, exhausted at first all its organic matter, and produced wonderful crops for some years; but at length it came to be, that, in 1839, rather an unfavorable season, and frequently previously in a field of upwards of twenty-five imperial acres, there was not produced twenty quarters (160 bushels) of oats, and the quality not so good as the dressings of a very rich and productive crop. It will be a very expensive and unremunerating process to recover this soil by rest and manure. Some parts were, at the same rate and at the same time, manured with lime containing a trace of magnesia, and these portions of the surface are still quite distinguishable from the remainder by a vegetation of an aspect if possible more miserable, sickly, and attenuated than that which covers the general surface.

5. We now come to consider the effects of Lime on a deleterious subsoil. On this subject we can also venture to say a little, from some experience and attentive observation in the improvement of waste land, and from extensive draining of arable and waste in the progress of improvement.

Subsoils frequently hold in their composition deleterious substances, which consist principally of the salts of iron or manganese, and some acid, resembling the gallic and acetic, derived from the decay of vegetable substances. We have witnessed the benefit in these instances of the application of quick-lime. In the first place, the lime attracts and combines with the acids, by which means the salts of iron and manganese are neutralized, and the acid adhering to the lime is not merely rendered innocuous, but converted into a positively fertilizing substance. Where any sourness, or vegetable acid in any form, exists in the soil or subsoil, which very frequently happens on examining the composition of waste lands with a view to improvement, and which has been caused by the long existence and periodical decay, while in its unreclaimed state, of a worthless vegetation, if lime be applied, it immediately combines with and neutralizes the effects of such deleterious components, destroying the acid by withdrawing its carbonaceous matter and oxygen, and thus, becoming a carbonate of lime, materially adds to

its own value as as a fertilizing ingredient. This we have tested frequently, so as to satisfy ourselves of the efficiency of an application of lime in all such cases, and of the perfect propriety of recommending it to an improver whose chemical knowledge may not be sufficient to conduct the simple process of analysis, if he should have any good ground for suspicion from the dark color of the subsoil, or any other familiar and often locally understood symptom that such latent causes as we have been describing are operating against his interest.

The salts of the protoxide of iron amount to thirty-eight, with nine double salts, making together forty-seven salts of the protoxide of iron; and these are generally soluble in water. The known salts of the peroxide of iron amount to forty-three, with twelve double salts, making fifty-five salts of the peroxide of iron, and they are *all* soluble in the same menstruum. Most of the salts of manganese are soluble in water, and on their precise degree of solubility depends their destructive and injurious effects. The salts of iron, where water abounds in the soil, gradually form, by combining with the earths, as we have often seen, a most impervious and injurious subsoil; but on being freed, by draining, of excess of moisture, and broken up, and, more effectually still, if trench-ploughed after draining, and thus partially exposed to the fructifying and pulverizing action of the atmosphere, such a subsoil will be speedily rendered innocuous; and, if lime be thereafter applied, the cure is complete;—and, after resting a little, a soil thus prepared may be converted to the purposes of profitable culture.

6. We have already, under head 2, shown the effects of the application of lime in improving the texture, constitution, and general fertility of the soil. We may now add here, that when calcareous matter is deficient in soils, it will be highly beneficial to supply it even in the state of native carbonate, and without calcination, if a supply can thus be more cheaply and conveniently obtained from the sweepings of the highways, which often contain a considerable admixture of carbonate, or from any other native calcareous deposit, such as shell or clay marl, or calcareous sand, &c. Clay marl is best adapted to sandy or siliceous soils, and shell marl and calcareous sand to clayey or aluminous soils or stiff loams. However, when too easily obtained, such advantages are sometimes abused: several instances of this kind have come under our observation, and we may here mention one as an example. On an estate in North Britain, where a very valuable and extensive marl deposit exists, permission was given to the tenantry to apply this substance to their farms free of all charge: their holdings chiefly consisted of light siliceous and very shallow peaty soils, and the proportions were left to their own discretion. This deposit was very rich in calcareous matter. It was used with something like suspicion and distrust at first in any great quantity, but some favorable results so raised the expectations of the tenantry that they heaped on their land an unlimited bulk, and the consequence was, that a few years of fruitfulness and of injudicious, and too often incessant cropping were succeeded by yearly increasing sterility and loud and fruitless lamentations. The soil, of course, will require the same treatment to recover it as if it had received an over-dose of unmixed lime.

7. The quantity of lime which might be applied to the soil in different cases is a most important subject; also, whether it seems most beneficial to apply lime in large quantity and at long intervals, or in smaller quantity and at shorter intervals; and we shall endeavor to be as explicit and intelligible on the subject as we possibly can.

In a deep peaty soil there is little danger that the proper quantity of quick-lime will be exceeded, and carbonate may be applied in almost any probable quantity. We need only instance as grass-grounds the famous Orcheston meadows. In a sandy soil there is scarcely more danger that this will be the case with carbonate, neither will it be so with caustic lime, provided it be well mixed beforehand with clay or common soil containing a proportion of organic matter, such as old turf dykes or pond scourings, or suchlike substances. When a soil contains a fourth part of alumina, (a stiff wheat soil,) and lime is to be applied for the first time, it should never be in less quantity, at the very least, than 150 bushels of shells, heaped measure, to the acre. A third part of this quantity should be repeated on occasion of every *third* fallow thereafter, to keep up a desirable activity in the soil, a great proportion of the first applied quantity having by this time disappeared and been washed away by natural agencies; and on each occasion of a fallow, when no lime is applied, from one cwt. to two cwt. of nitrate of soda or potash to the acre should be carefully sown over the young wheat or turnip crop, as it may happen, a moist morning being selected for the purpose; and this will not only nourish and stimulate the young plants, and effectually destroy the numerous tribe of insects and their larvæ, so peculiarly destructive to the turnip crop in its first stages, but what is not appropriated of it by the plants descends with the moisture into the soil, and immediately acts upon the lime, now chiefly become a carbonate, by depriving it of its acid, and restoring it to its original state of purity, when its caustic properties are restored, and it again operates with the same activity as when first applied to the soil. It is necessary to apply the 150 bushels in the first instance to insure the effectual solution of the natural and necessary accumulation of the insoluble organic matter which must occur in a soil which has been covered with vegetation of any description; but a small application every third fallow, with the alkaline application to each of the two intermediate fallows, will thereafter prevent any such useless accumulation of insoluble organic matter, which needs must otherwise increase in the soil from the annual decay of the root fibres and other accidental and necessary remains of the different natural herbage, plants, and crops of the previous rotation.

When a soil is composed of four parts in five of silica, the remainder being principally alumina and organic matter associated with a portion of impalpable siliceous powder, it may be made a superior turnip soil, and incalculably improved by the application of carbonate of lime in large quantity; but about 100 heaped bushels of shells to the acre will be a sufficient dressing of caustic lime on a first application to the soil, care being taken that a fair allowance of manure is always supplied at each recurrence of a fallow, and it may be repeated in the same proportion and at the same periods (a third to every third fallow thereafter) as we have just recommended in clayey soils. The quantity of nitrate of potash or soda, be it observed, to be

the same in both cases, that is, the same both in aluminous and siliceous soils, but the proportion of lime to vary as 100 to 150, both in the first and successive applications. We have every reason to think, from all our patient investigation, experiment, and experience that this will eventually be found a very economical and effectual if not the most economical and effectual, method of applying lime to soils.

When easily and cheaply obtained, about fifteen bushels of wood or peat ashes, applied in the same manner, form a good substitute for the nitrate of soda or potash; and bituminous peat for this purpose is always to be preferred.

8. We have already stated that we have universally found that, unless thoroughly underdrained, it is in vain to expect any remunerative return from the application of lime, and we may add, any description of manure, whether organic or inorganic. Where superfluous moisture exists, the interstices of the soil are completely choked up with the fluid, the beneficial action of the atmospheric air excluded, a sourness contracted prejudicial to healthy vegetation, and the fructifying portions of the manure rendered inactive or washed away beyond the reach of a crop, while the temperature of the soil is also materially reduced by the presence of superfluous moisture.

9. The effect of applying lime along with other manures, that is, at the same season, and to the same crops with other substances, depends entirely on the period of the operation of fallowing at which it is applied.

If it be applied to the fallow before the dung, and harrowed sufficiently into the soil, intermixed and incorporated thoroughly with it, the lime will combine with and immediately operate in reducing all the root fibre and insoluble organic remains of the natural herbage or previous crops as it may happen to meet with, and thus convert into nutriment, for the succeeding crop, what was before of no service whatever; and if any acid or noxious rejected matter should be left by the plants of the previous rotation, as is believed by many scientific persons to be the case, the acid and noxious principles are neutralized by the lime, and the soil purified and enriched at same time. If not laid on, however, till after the dung is applied, of course it must and does abstract carbonaceous matter and oxygen from the manure, in the first place, combining with the more soluble portions, and this combination rendering them temporarily in great part less soluble, and thus not so well calculated to afford immediate nutriment to the succeeding crop. This may not be of such importance in wheat culture, which crop is best treated as a biennial, and thus remains a long time on the ground. But it does not appear to be so well calculated for a turnip crop, requiring as it does an immediate and concentrated supply of stimulating and soluble nourishment. With farm-yard dung it does and must operate in this way.

We have used street manure to turnips, which suits this crop better than most others. Street manure frequently contains a considerable portion of carbonate of lime, and sometimes native sulphate; but an application of caustic-lime, after adding this manure to the soil operates precisely as in the former case we have been describing, in forming compounds partially insoluble in water, and in withdrawing carbonaceous matter and oxygen, and thus being ultimately converted into a carbonate.

Rape-cake we have used very little, although, thrown into the soil along with the seed of turnip, in moist seasons, it makes a capital dressing, as we have often witnessed. It is well suited to clay soils in some cases; but it is scarcely adapted to a fallow, unless combined with more substantial and lasting manures.

We have used bones extensively in different soils, but always as limed land, and have never paid particular attention to the effects of applying both at the same season. We know, however, from very careful analysis, that the following is their composition:—

Cartilage—a compound of Carbon, Oxygen, Hydrogen, and Nitrogen..... 33.3	Carb. of Lime.....11.3
	Phos. of Lime.....51.4
	Fluate of Calcium.....2
	Phos. of Magnesia....1.16
Soda.....1.2	

Of course the application of caustic-lime would operate powerfully in reducing the bone, by acting on the cartilaginous portions, and withdrawing the carbon and oxygen; but we have always found the most efficient and economical method of applying this manure to be over a portion of spit dung previously deposited in the turnip drills, which is preferable even to mixing the bones with the manure to cause fermentation before applying the mass. The evolution of gases and volatile alkali, with the increase of temperature during the fermentation caused by the subterposition in the drill of the spit dung, affords the most forcing and stimulating nourishment to the tender germ, and has the further recommendation of economy and efficiency.—We have grown a very excellent crop of turnip on a very dry light siliceous gravelly soil, with eight bushels of bones, over ten single horse-cart loads of farm-yard dung, an acre.

With regard to *soot*, we have witnessed its admirable effects sown over grass lands, spring corn, tares, and young turnip, but have never seen it applied at the same time with lime. It is most effectual in destroying the numerous insects which prey on vegetables in their early stages. However, we should think it injudicious in the extreme to apply it with quick-lime, which would immediately and wastefully decompose its substance by disengaging a great portion of the volatile alkali, although there would not be the same objection to sulphate of lime, which would rather operate in preventing the too rapid disengagement and dissipation of its volatile parts.

We may conclude this head by remarking that where the object is permanent pasture, the application of the manure and the lime *at the same time* has been found beneficial, the effects being more lasting; but quick-lime or hydrate should never be applied to rich fertile old loams in cultivation, containing much soluble organic matter, unless as a compound with vegetable mould, or in some shape intimately combined with organic substances.

10. It seems superfluous here to describe the familiar operation of fallowing. All that one need say is, that after this cleaning operation has been carefully executed on the best principles, the lime should be well harrowed in and thoroughly incorporated with the soil. From being reduced to a hydrate it becomes so perfectly divided, and its particles rendered so minute, that the chemical action on any organic remains of former crops it meets with in the soil is immediate, and thus, rapidly becoming mild from this action, it is, in a manner, prevented from combining with the more soluble portions of the sub-

sequently applied organic manures. Care must always be taken not to exhaust the soil by over-cropping after the application of lime in any shape, and the most approved and least exhausting course or rotation adopted on similar soils should never be departed from; and a farmer should never yield to the lure of a deceitful fertility consequent on a first application of lime; for the stimulus which produced this fertility will speedily exhaust the vigor of the soil, unless its energy is supported by judicious management.

11. It is very advantageous in some cases to apply the lime in the form of a compost, with clay, earth, or sand. A sort of artificial marl is thus formed, which is advantageously spread on grass lands, affording them additional nourishment, at the same that the quick-lime or hydrate is partially deprived of its caustic property, which recommends the practice much—caustic-lime in powder being, in quantity, destructive to living vegetables. When the object is to improve the texture of a soil of sand, or clay, or peat, a compost has much to recommend it.—Lime combined with sand being best adapted to an aluminous or peaty, and with clay for a siliceous subject. A compost in such cases has been found to be eminently beneficial, and preferable to the application of unmixed lime.

ELECTRICITY

APPLIED TO AGRICULTURE AND HORTICULTURE.

As heretofore intimated, we may here repeat, that the experiments in the application of electricity, which have lately attracted a good deal of notice in Europe, have not been attended with results sufficiently uniform and encouraging to warrant plain, prudent, practical men, in giving their time and pains to a subject as yet rather too much *in the clouds*. Still, as one of the sentinels, on the look out for any thing that may turn up in this very age of invention and discovery, it will be expected of us to cry Who's there? whenever any thing new makes its appearance on the Agricultural Horizon.

In cases like this, as in the application of steam and the attraction of lightning from the clouds, the way is, perhaps too much so, to receive the first suggestions with distrust, if not ridicule. "Visionary enthusiasts," "crack-brained men"—generally pennyless, are left to go ahead, as they may, or fall as they often do, victims of poverty, distrusted and repulsed by your "practical man," and your "man of means"—such was the fate of Fitch—such of Rumsey. It was not their kind fate to meet with a BRIDGEWATER, an APPLETON, or a LAWRENCE; and the world knows them not as the first suggesters of steam appliance to navigation—poor they lived and dying are forgotten. Within the limits of this very corporation lives now almost unknown, if we are not misinformed, a second James Watt, in the person of a retiring and obscure genius—BOGARDUS.*

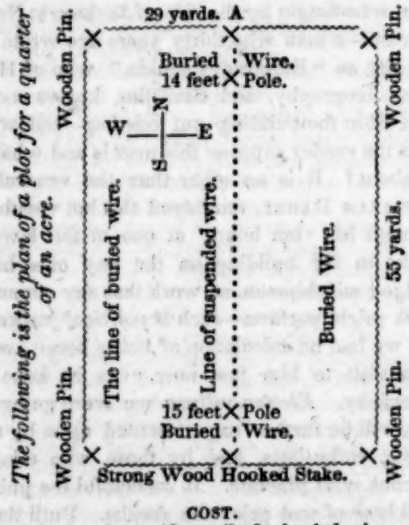
In the garret of the Treasury Buildings at Washington, is a gray headed man, of three score years and ten, with an eye and a soul fired with intelligence and spirit—the man who first measured the Sabine with chain and compass, who fought by the side of Jackson at New Orleans—a man who thirty years ago wrote in this city an "Emigrant's Guide," who of History, Geography, and Statistics, knows more than all in the building put together—and who does the reader suppose this man is and what is he about? It is no other than the venerable WILLIAM DARBY, employed this hot weather, through his 'ten hours,' at one of the lowest desks in the building, on the pay of a half-fledged midshipman, at work that any common clerk might perform—such is *political* justice—but we had no calculation of being borne away on a visit to him just now, even by force of electricity. *Electro-culture*, we were going to say, will be further experimented upon by scientific enthusiasts, and by those who mingle science with practice. If successful the public will hear of and enjoy the results. Until these are known, we shall do no more than note what occurs at home and abroad, as briefly as may be consistent with our duty to journalise such things. Happily the monthly space allowed us leaves us still room enough to keep pace with all practical developments. None, therefore, we are persuaded, will deem it inappropriate that we cater as well for the man of the closet, as for him of the field. For the votary of science who goes before to explore the grounds and mark out the way, as for the working man who follows after to reap and gather the fruits of his discoveries. What follows then, is what we have seen most worthy of preservation. We are aware that what is stated in reference to *Mr. Foster's* experiments, has already been published in most of the agricultural journals;

* See Proceedings of American Institute, vol. I page 424.

and will therefore be already familiar to most of our readers; but as some of the other articles refer to this statement it has been deemed best to preserve at once and together these different accounts and suggestions, that the subject may be, as far as this journal is concerned, dismissed until the close of the year, when doubtless we shall have reports of other and perhaps more particular and reliable observations.

In such a case it is better to do a little too much, than to fall short of what might be expected or useful.

CORN CULTIVATION BY ELECTRICITY.—At a meeting, last week, of the Polytechnic Society of the West Riding of Yorkshire, the following description was given of the result of the first considerable experiment of applying the free electricity of the atmosphere to the cultivation of corn. Dr. Forster, of Findrassie House, near Elgin, had thrashed, weighed and measured his electric cultured chevalier Barley, and the product was the enormous quantity of 104 bushels, or 13 quarters per ton! The tail corn was not measured, and each bushel weighed 54¼ lbs. The weight of the straw was 9,300 lbs. per acre. The cost of the electric apparatus is £1 per acre, which will last for twenty years.



COST.

6 lbs. of iron wire at 4d. per lb. for buried wire,	2s.
4 do. do. at 3d. per lb. for suspend. do.	1s.
2 poles of dry wood, at 6d. each,	1s.
Labor, &c.	1s.
	5s.

As the area increases the cost diminishes rapidly. Convenient and desirable areas are for—

Two acres, 127 by 75 yds.		½ of an acre, 73½ by 33 yds.	
One acre, 80 by 55	do.	¼ do.	55 by 22 do.
¾ of an acre, 82½ by 44	do.	⅛ do.	36 by 16½ do.

The mode in which the plot is laid out, is as follows: with a mariner's compass and measured lengths of common string, lay out the places for the wooden pins, to which the buried wire is attached, (by passing through a small staple). Care must be taken to lay the length of the buried wire due North and South by compass, and the breadth due East and West. This wire must be placed from 2 to 3 inches deep in the soil. The lines of the buried wire are then completed. The suspended wire must be attached, and in contact with the buried wires at both of its ends. A wooden pin with a staple must, therefore, be driven in at A, and the two poles (one 14 and the other 15 feet) being placed by the compass North and South, the wire is placed over them and fastened to the wooden stake, but touching likewise at this point the buried wire. The suspended wire must not be drawn too tight, otherwise the wind will break it. [Electro culture is a very interesting subject; but we must not allow ourselves to be misled by it. It is to be regretted that Dr. Forster's experiments are not given at more length; at present they are so imcompletely stated, that no opinion can be formed upon them. As to iron wires lasting in the ground for twenty years, that is inconceivable, unless they are protected in some way. Upon the whole, we think it better to wait, than to come to any conclusion either one way or the other.] Lond. Agr. Gaz.

ELECTRIC AGENCY APPLIED TO HORTICULTURE.—I have been making several experiments, the results of which have been of the most satisfactory character. My application of the subtle agent has been through the medium of galvanism, and as it is generated it is totally under control, which is not the case if it is collected (as is generally the case) from the atmosphere, which is always subject to the uncertain fluctuations known to exist in telluric and atmospheric electricity. My experiments are, of course, far from matured, but yet they may not be void of interest to yourself.

First Experiment: I took an old 50-pair galvanic trough, and lined one-half the length of one side with zinc, and the opposite side in a similar manner with copper; they being about 12 inches long and 2 deep, leaving a distance between the plates of 4 inches, and connected by a zinc band. The trough was filled with moist soil and Turnip seed sown thickly upon the surface and pressed into it, but not covered, one-half being under the galvanic influence, the other in a natural state. Results: the seeds under galvanic influence swelled and sprouted many hours before the others, and twice as many vegetated; and by the time they were all well up the galvanic ones had the advantage of 24 hours. I should tell you that they were placed in a temperature of more than 60°, and were all well up in three days; therefore 24 hours is a most extraordinary advance.

Second Experiment: I lined a common flower-pot, 6 inches wide at the top and 4 at the bottom, with zinc and copper, as in the last experiment, the plates being, of course, deeper; I then sowed three Cucumber seeds in it, and three in another pot, without galvanism, and placed both in the same temperature, as the last experiment. Results: In the course of two days, the galvanic seeds appeared 11 hours before the others; in three days both were well up, the galvanised having greatly the advantage in strength and color, and going a-head rapidly. After a lapse of a fortnight, the galvanised seeds seemed to have the advantage of four days' growth, were much darker in color, and about twice as strong, healthy, and vigorous. I also tried an experiment with some Peas, which had been sown some time previously, and were just cutting the ground. A zinc plate, 1 foot square, was placed at the end of one of the double rows, and buried to an inch below its upper edge, and a similar plate of copper was buried

at the other end to the same depth, and connected by a copper wire. The weather was showery, and the growth of all was rapid. In the course of 30 hours, the galvanised ones had assumed a darker appearance, and were more regularly up than the others, and decidedly in advance; and in the course of a fortnight they were so much forwarder than the others, as to be easily seen at a considerable distance, and were altogether much higher and stronger. I am also trying an experiment with some Potatoes, but they are not up yet. These results have been so satisfactory to me, that I intend to try the principle upon an acre of Barley, and am preparing the wires for that purpose; and, when finished, will send you the results. A.

ROYAL INSTITUTION, May 16.

Reverend E. Sidney on the Electricity of Plants, and influence of Electricity on Vegetation. In introducing the subject of his lecture, Mr. Sidney took occasion to draw attention to the important nature of the inquiry, its high interest as a branch of natural science, and the valuable practical results which might possibly be brought to light in its investigation. The attention of electricians, he stated, had been drawn to the subject so long back as 1746, when a Mr. Maimbray, at Edinburgh, announced that electrified plants grew more rapidly and vigorously than those that were not so treated; about the same time the Abbé Nollet discovered that electrified seeds germinated with increased facility; and these observations were confirmed and extended by the experiments of Bertholon and Jalabert, the former of whom attributed very marked effects to the use of electrified water.—The truth of these experiments was supported by some electricians, but denied by others, who, upon repeating them, could not perceive any effect produced on the electrified plants: amongst the latter class stands the name of Sennebier; but on reading the account of how his experiments were performed, it is no longer surprising that he failed to perceive any effect from electricity as he placed the seeds which were to be electrified inside an electrified vessel, a situation in which it is evident they would not be exposed to the electric influence. After briefly adverting to the more recent observations of Davy, Pouillet, and others, Mr. Sidney drew attention to the recent progress of the subject, and the high interest it was at present exciting. The first point which the lecturer insisted on, was, that electricity appears to exercise a powerful influence on growing plants; in support of which he quoted a number of experiments and observations, all tending to show that plants, under the influence of electricity, grow with increased vigor, and more especially when negatively electrified. The manner in which drooping plants have been observed to revive, on the artificial application of electricity, was also noticed; and, lastly, the effects which are found to be produced by thunder-storms were described. The rapid growth of plants during thunder-storms might, no doubt, in part be attributed to other causes; but, at the same time, it was a very fair inference that the electric condition of the air had something to do with the phenomena, as such a conclusion was borne out by numerous experiments, on a small scale, made with artificial electricity. Electricity of low, like that of high tension, has been found to affect germinating seeds and growing plants in a remarkable manner; it was noticed by Davy, that seeds germinated more freely at the negative pole of the voltaic battery than at the positive, and since his time numerous experiments have been made, all tending to prove that voltaic electricity powerfully affects plants. Mr. Sidney next drew attention to the facility with which fresh vegetable matters conduct electricity, in consequence of the good conducting power of the fluids which they contain; this was illustrated by placing a small blade of Grass in contact with the conductor of a powerful electrical machine, when it was proved that the whole of the electricity generated by the machine was quietly carried away by the blade of Grass. It was also shown that the pointed forms of the leaves and other parts of plants, combined with their good conducting power, fitted them most admirably to receive or disperse electricity; and hence electricians sometimes employed vegetable points in place of metallic ones for those purposes. To show this, a large Leyden jar was quickly and silently discharged, by bringing the pointed blades of Grass near its outer surface, and the brass knob at the top. In consequence of the high electric powers of plants, as might be supposed they exerted a marked effect on the electric condition of the atmosphere, so that when an electroscope indicated abundance of electricity in the free open air, it indicated none in the vicinity of a tree with pointed leaves. In illustration of the good conducting power of vegetable matter, Mr. Sidney stated that it was impossible to give an electric shock to a circle of people standing on a lawn, as the electricity invariably took the shorter and better conducting course through the Grass; whilst there was no difficulty in giving a shock to any number of persons standing in a circle on gravel. 3dly. The apparent adaptation of the various parts of plants to different electrical uses, was pointed out.—Thus, the first leaves of many plants are pointed and acute; others rounded or globose. The buds of most plants are pointed, or covered with a strong pubescence. Some plants, more especially those which grow rapidly, have an immense number of sharp points, or pointed hairs; whilst those which grow less rapidly, or are intended to meet the variations of the seasons, are less pointed, but often provided with dry thorns or prickles. As plants come into flower, they generally tend more to a globose form; the flower-buds are generally rounded, and the fruit, or seed-vessels, are seldom provided with acute points. It may, therefore, possibly be the case, that though electricity is favorable to plants at one stage of their growth, it is hurtful to them at others, just as is well-known to be the case with light, which is essential to them when full-grown, but is hurtful to them in the embryo state. The general phenomena of vegetation were then considered in relation to electrical agency. It would prove an interesting subject of inquiry, to examine in how far the rise of the sap in spring is influenced by electricity; it is certain that in spring, and before the leaf-buds are opened, whilst they still retain their pointed form, the air is dry, and in the most fitting state for electrical effects. Mr. Sidney then adverted to the singular powers which plants have of precipitating moisture from the atmosphere, an effect which he suggested might possibly be of electric origin, and endeavored to strengthen this view by a number of ingenious arguments; amongst others, the remarkable cases described by Mr. Weekes and other electricians, in which showers of rain were brought down by the use

of uninsulated kites. The lecturer next endeavored to show that the forms and geographical distribution of certain species of plants indicate a relation to their electrical properties. Thus, for example, the numerous Pine and Fir trees which abound in high latitudes, present most admirable extensive discharging apparatus for receiving or dissipating electricity; and, supposing the preceding observations correct, such trees would exert most important and beneficial influence in equalizing the electric condition of the atmosphere and tending to produce a greater uniformity of temperature. Lastly, the subject was considered as a purely practical one, and the prospect which there exists of electricity being advantageously applied to stimulate or assist vegetation inquired into. Mr. Sidney seemed to think it very questionable whether electricity could ever be usefully applied to the improvement of agriculture, but in horticulture (in forcing flowers and fruits,) he thought there were prospects of decided benefit; and, therefore, that this branch of the subject was well deserving a careful experimental investigation.—Electricity, both common and voltaic, might probably be advantageously employed in assisting the germination of old and dry seeds; and likewise, applied with caution, in the culture of exotics and other hot-house plants, its use might be productive of good results. The lecturer exhibited several plants which he had caused to grow in earth under the influence of a feeble current of voltaic electricity, generated by a plate of zinc and another of copper, connected together, buried in the soil beside the roots of the plants; and in the case of plants of Potato, Cineraria, and Mustard, which he exhibited, a very marked effect appeared to have been produced, as the galvanised plants were larger and much more vigorous than those without the plates.—He stated that he had also produced a very good effect on Pines, Cress, and Fuschias, but had found plants of Pelargoniums killed by the application of the zinc and copper plates. The well-known experiment of Dr. Forster, on Barley, was then described, and shown to be a decidedly unphilosophical arrangement, so that it appeared very doubtful whether electricity had anything to do with the large increase of crop said to have been obtained by that gentleman.—At the same time, the experiment was highly deserving of attention; and Mr. Sidney suggested that it would be well worth while to try experiments on electro-cultivation, describing several which have been commenced in Norfolk and elsewhere, on more accurate principles; he also gave a brief sketch of some of the experiments on this subject, at present being made by Mr. Edward Solly, in the gardens of the Horticultural Society. The lecture was, throughout, worded in the most guarded and cautious language, the whole subject being new, and but very little understood; it was, therefore, brought forward rather with a view to excite attention, and induce further research, than to propound theories, or make startling assertions. Mr. Sidney very justly observed, that putting all theories aside, there appeared to be sufficiently numerous well-authenticated facts to warrant further inquiry and experiment.

From the London Agricultural Gazette, June 7

ELECTRO-CULTURE.—The extraordinary effect of Electro-culture, as stated by Dr. Forster on his Barley crop, has induced me to make an experiment precisely according to the plan and diagram given in your number of the Agricultural Gazette for April 12th; but as I only put the wires down so lately as the 23d instant, after the Barley was above ground, it is too soon yet to expect any difference, and none is yet visible; but as I purpose making two or three more experiments on other crops, and I observe in your last Number that the experiment of Dr. Forster's plan is described as not being a very scientific one, and that experiments are now in progress in Norfolk and elsewhere on more scientific principles, I shall feel greatly obliged to you if you can furnish me with the particulars of such experiments, or of any one that you consider more likely to bring out the best results for my guide, before putting down any more diagrams on this interesting subject.—*X. Y. Z., A Subscriber.* [The effect, or rather the *tendency* of any metallic connection between the soil and the air, some 15 or 20 feet above, clearly must be to induce a similar electric condition between the two—to hinder any irregularity in the distribution of electric influence—simply because metals are good conductors of electricity. Whether such a result is desirable as regards the crops growing on the soil remains to be ascertained; but certainly, in order to obtain it that arrangement of wires must be best, in which there is the most perfect connection by conductors between the soil and the air. Perhaps other purposes may be answered by Dr. Forster's arrangement of wires; but so far as they tend to connect by electric conductors the soil and the air, we do not by any means think it the best that could be suggested. We have had since February a copper wire 120 yards long, studded with upwards of 1200 metallic points, suspended in a direction magnetically north and south, in a somewhat elevated position, at a distance from trees, and at an elevation of 20 feet from the ground; and this wire is connected with the ground by another, which, when it meets the ground, branches out and spreads over an extent of about the 8th part of an acre, on which Wheat is growing; but the plants have not *in appearance* benefited the least from it. Dr. Forster declines to be responsible (and justly so) for the results of experiments performed otherwise than as he has directed; but we cannot see what influence his arrangement of wires possesses that ours has not in a greater degree.]—The following is another communication on this subject, just received:—Since I communicated my trial of Dr. Forster's plan of electrical cultivation, a plot of Potatoes, similarly treated, has been followed by similar effects. The rows within the wire are distinctly visible, those without only partially appearing. In both cases, the row adjoining the buried wire is favorably affected, though not included in the square. This lateral influence every electrician would expect; the great wonder is, how the electricity is so perfectly confined within the wires.—Though, of course, the theory is nearly a mystery at present, we must infer that the aërial wire collects the fluid and the buried wire distributes it to the ground, through which it percolates and stimulates the vegetation. Of course if you extend the enclosed area too much, the supply of electricity would become inadequate. If you increase the number of aërial wires you would obtain more electricity, but fail in its gradual and equal distribution. For these reasons, which I think Dr. Forster has misapprehended, I still recommend future experi-

menters to try long narrow parallelograms, and avoid large areas. What has hitherto been done on this subject is of small moment: the attempts have been merely trifling and theoretical. Dr. Forster has the sole merit of first suggesting a useful and economical application of this wonderful agency. In fact, the great objection to the success of his system is, that such a sudden advance in cultivation as this promises has never been made before, and seems almost contrary to the laws of nature.

BETA.

EIGHTEENTH ANNUAL FAIR OF THE AMERICAN INSTITUTE.

Of this great national display of the products of *American* Agriculture, Arts and Manufactures, we have room only for a few words of exhortation to every friend of the substantial interests of his country to lend it his countenance and encouragement in every form. We are well advised that the exhibition will be opened to the public on Monday, the 6th day of October, 1845, at 12 o'clock M. at Niblo's Garden, Broadway, in the City of New-York. Contributions from exhibitors will be received on Thursday, Friday and Saturday of the previous week. To insure the most favorable locations, and the advantages of competition, the products of the Manufacturer, Mechanic and Artisan must be delivered and entered on the books of the Fair, on one of those days. The chance of a good location will be in favor of those who come the first and second days. Fruits, Flowers, &c. form an exception. The proper time for entering them will be specified in the Agricultural and Horticultural circular, or notices hereafter to be issued.

Arrangements already made, and in progress, for carrying out the Eighteenth Celebration, are on a scale more extended and attractive than ever before; and if public favor towards this institution continues to extend and increase each year as it has during the last seventeen, means will be afforded of enlarging the value of the premiums, and thereby creating a more intense and universal competition. Several opulent and munificent individuals, desirous of making the exhibition worthy of our great Emporium, and giving a fresh impulse to improvements in our country, have volunteered donations for the purpose; others have promised not only to contribute, but to use their influence to cause their friends to do the same. After reserving what discretion demands, to cover the annual current expenses of the Institution, every dollar will be expended by the Managers to promote improvements in Agriculture and the Arts. It is the fixed policy of the Institute, to appropriate every dollar for the benefit of that public which has been its generous, unfailing patron.

There will be an opening address, followed by novel and interesting displays of fireworks.

On Thursday, the 9th of October, a National Convention of Farmers, Gardeners and Silk Culturists will be held.

For the second week has been assigned the Cattle Show and other live Stock, and the plowing and spading matches.

The Anniversary and other discourses will also be delivered in the course of the second week.

The Horticultural exhibition of vegetables, fruit, flowers, &c. will be in Niblo's long promenade, and superintended by eminent Horticulturists.

The best new and useful inventions will be objects of the highest honors.

The following is the list of *Managers*—while their names give assurance that all will be done rightly, and in order, the thanks of the community are due to them, in advance of that performance, which with such citizens, is sure to follow their consent to serve:

Adoniram Chandler, Edwd. T. Backhouse, John Campbell, Jas. Van Norden, H. W. Childs, Joseph Curtis, Geo. Endicott, Wm. Hall, Joseph Torrey, Jas. R. Smith, Martin E. Thompson, Isaac Fryer, John D. Ward, Edward Clark, Robert Lovett, Gurdon J. Leeds, A. D. Frye, T. B. Stillman, Joseph Cowdin, Jas. J. Mapes, Geo. F. Barnard, C. C. Haven, Chas. Mapes, Jonathan Dodge, T. W. Harvey, T. B. Wakeman—*Managers.*

We may be allowed to add, with some sense of national pride, that in these exhibitions, our American Institute here, at the great commercial Emporium of the Country, has set an example of sagacious attention to great public interests, which even London is only just now about to follow.

The London Athenæum has just announced the "possibility of establishing something of the kind in the British Empire." We, thanks to the indefatigable officers and managers of our Institute, are already in the fruition of what they are just hoping to accomplish. In the announciation of their project, in the Athenæum of June last they say:

"Besides the delight and instruction which would certainly be afforded, it may fairly be expected that a periodical competition of this nature will exert some beneficial effect on the progress of the Arts; not only by exciting honorable rivalry in the producers, but by enabling the consumers better to appreciate real excellence.

Without entering into details, it may be stated, that the plan embraces the exhibition not merely of products, but of the instruments of production in actual work—the facility, rapidity, precision, and economy of the act of fabrication being often much more wonderful than the fabric itself. In carrying out these ideas, it is intended entirely to exclude all private, personal, and political objects. It is hoped that the plan may be preserved so free from objection on these points, as to command the approbation of all ranks, and justify its promoters in anticipating the highest patronage."

NEW-YORK STATE AGRICULTURAL SOCIETY.

CATTLE SHOW AND FAIR FOR 1846, TO BE HELD AT UTICA, SEPT. 16, 17, 18.

THERE is every reason to hope that this great gathering of practical Farmers, the bone and sinew of the land. will transcend in numbers and in display of the products of Agricultural Industry, all that have preceded it. At the season chosen, there will still be lingering a vast number of strangers, who have come to escape exposure to the enervating heat of Southern climes, and to observe the habits of their more thrifty brethren of the North. We would recommend all such to gather in at Utica, at the great Cattle Show—there they will see Northern men and Northern Industry in their true character and genuine colors—hard hands and hard sense, with their fat bullocks and their fine-wooled sheep—their sharp plows and sturdy oxen to turn the glebe—the 50 acre man, as proud in his position and as useful in his sphere, as any Lord of the Manor. After all, what is there to be envied, about the man of overgrown estate, except the sagacious industry which may have made him so; and the power that being so confers on him, to set useful examples in illustration of modes of improvement, and in the introduction of good things that require extraordinary means. In that light the rich man is truly enviable. In every department of Industry, in every implement of Agriculture, those who attend this great Exhibition, and that of the American Institute, may expect to see something new. Come, then, Farmers, one and all—these are your Holidays. Let it be there seen, that if the Merchant can boast his splendid Ship, sailing faster than the wind, the Manufacturer his Works, in which omnipotent steam is controled with equal ease to carve a seal or lift the ponderous tilt hammer; so you can show your well-tilled Farm, your sleek horses, your fat cattle, and rich products of the field and the orchard, the dairy and the garden; all emblems as well of *peace* as of *plenty!*

The public has been in so many forms advertised of the particulars for which premiums have been offered, that we see no occasion, even if we had room, for publishing the Bill of Fare in detail. The first on the list are:

For the best cultivated Farm, of not less than 50 acres, exclusive of woodland, regard being had to the quantity of produce, the manner and expense of cultivation, and the actual profits:
First premium.....$50 | Second do.....$30
Third do.....$20

But, what we humbly regard with peculiar approbation is the offer of Premiums:

For the best series of Essays on the importance of scientific knowledge in prosecuting successfully the ordinary pursuits of Agriculture....$100
For the best Agricultural Text-Book for Schools. 100
For the best Text-Book on Horticulture 50
For the best Essay on Subsoil Plowing, with the results of actual experiments in the State of New-York 20
For the best Essay on Draining, with details of the results of actual experiments, showing the expense and supposed increased value of the land..... 10
For the best Essay on Irrigation 10
For the best Essay on the Culture and Manufacture of Silk..... 20
For the best Essay on the prevalent Disease in Potatoes..... 20

CATTLE are classified into and premiums offered for *Durhams, Herefords, Devons, Ayrshires, Crosses of Natives and Improved, Native Cattle* and *Oxen—three year old, two year old,* and *yearling Steers,* and *Fat Cattle.*

SHEEP into *Long-wooled, Middle-wooled, Merinos* and their grades, *Saxons* and their grades, and *Fat Sheep.*

HORSES into *Stallions, Mares, Matched Horses* and *Geldings.*

SWINE into *Boars, Sows,* and *lots of Pigs.*

And, for the rest, prizes are offered for

Poultry, best *Farm Implements, Butter, Cheese, Maple Sugar, Corn-stalk Sugar, Silk,* various *Domestic Manufactures, Fruits, Flowers*—best crops of *Wheat, Indian Corn, Rye, Barley, Oats,* not less than *two* acres! and the various Vegetables most cultivated, besides *Hops, Flax, Broom Corn, Clover* and other *Grass Seeds.*

Those who present claims to premiums for farm-crops must state in writing the following particulars: The condition of the soil at the commencement of cultivation for the crop; the previous crop and cultivation, and quantity of manure used upon it; the quantity and kind of manure the present season; the quantity and sort of seed used; the time and manner of sowing, cleaning and harvesting the crop; the amount of the crop determined by actual weight or measurement; and the expense of cultivation. The land shall be measured by some surveyor, who shall

swear to the correctness of his survey, and that it was made with a chain and compass; and the claimant of the premium, with two other persons who assisted in measuring, shall certify under oath as to the quantity produced from the piece of land mentioned in the certificate of the surveyor; and a sample of grain shall be presented at the annual meeting, with the oath of the applicant that that same is a fair sample of the whole crop.

MISCELLANEOUS.

Wrought Iron Gate with cast iron pillars.....$10
Best iron Wheelbarrow.....Silver Medal.
Ornamental cast iron Vase on pedestal.....$8
Best sample Drain Tile.....Silver Medal.
Best quarter of an acre Ozier Willow.....$8

DISCRETIONARY PREMIUMS

Will be awarded for such implements, products, &c. not enumerated, as shall be deemed worthy of notice or encouragement.

REGULATIONS.

The premiums for Essays and Agricultural Implements will be open to citizens of other States; all others will be confined to residents of this State who are members of this Society, or who may become so by the payment of one dollar on entering their articles.

The trial of plows will take place at Utica, on Tuesday, the 15th day of September.

No premium will be paid on any animals or articles taken away before the close of the Show.

Premiums not claimed within four months after they are awarded, will be considered as donations to the Society.

All persons who intend to exhibit Cattle, Horses, Sheep or Swine, should give notice to THEODORE S. FAXON, Utica, or LUTHER TUCKER, Recording Secretary, Albany, previous to the 10th of September, that the necessary arrangements may be made for their accommodation; and all animals must be on the ground by 9 o'clock A. M. of the 17th of September.

All those who intend to compete for the premiums on Agricultural Implements, Butter and Cheese, Sugar, Cocoons, Silk, &c. should have their specimens on the ground on the 16th, that they may be deposited in their appropriate places, and the rooms suitably arranged on the day previous to the Show.

Applicants for premiums are requested to pay particular attention to the notes attached to the premiums on Fat Cattle and Fat Sheep, Butter and Cheese, Field Crops, Maple Sugar, &c.

The statements required from those who compete for Field Crops, must be sent to LUTHER TUCKER, Recording Secretary, Albany, previous to the 1st of January, 1846, and the premiums will be awarded at the Annual Meeting of the Society, on the third Wednesday of January.

Competitors for the premiums on Essays must forward their manuscripts to the Recording Secretary, Albany, previous to the 1st of January, 1846, free of postage.

No premium will be awarded, unless, in the opinion of the Judges of the class in which it is offered, the animal or article is worthy of such premium.

Prize animals and implements at the previous exhibitions will be allowed to compete for the prizes; but they must receive a higher prize, or in a different class, to entitle them to a premium. Should the same premium heretofore given them be awarded, they will receive a certificate to that effect, instead of the prize.

Animals and other articles offered for competition must be labeled with the names and residences of the owners at full length.

No viewing Committee, with the exception of the Committee on Discretionary Premiums, shall award any discretionary premium, without the previous permission of the Executive Board, expressed through the President.

☞ We have in type brief notices of several new Works on Agriculture, Gardening, &c. which we are obliged to defer to our next issue.

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THE AMERICAN FARMER—*Baltimore.*—This oldest of Agricultural papers has changed its form and dress, from a quarto of 8 to an octavo of 32 pages; but it is animated by the same patriotic spirit, and aiming at the same honorable ends, with a zeal and courage that bid defiance to time and circumstances. The July Number contains no less than 76 different items and several illustrations. Among these is one labeled with the name of RIVERSDALE, the residence of Charles Calvert, Esq. (a seat of genuine old-fashioned Maryland hospitality,) and his Cow, CINDERELLA.

Whether the design of the artist was to bring the white cow into bolder relief, by blackening every thing near and around her, we know not. but truly the picture more resembles a "coal-field" than the verdant Riversdale we have been accustomed to admire. The Am. Farmer goes, however, for substance, not for show; and he who is not glad to get it for $1 a year must be very indifferent to what is going on in the Agricultural world around him. It is a much better paper now than when we sold it for four or five times as much, and would truly be worth its reduced price of $1, were it only to be used for ladies' hair paper!

GOOD SIGNS FOR THE SOUTH.—Such do we regard the multiplication of Agricultrual Journals. Two have just reached us: THE NORTH CAROLINA FARMER, edited by S. Jemay, Raleigh. The Editor tells us that the spirit of improvement is abroad in Georgia, South Carolina, Tennessee and Virginia, and adds, as to the prospect in North Carolina: "We are gratified to state, to the honor of the Counties of Granville, Orange, Mecklenburg and Buncombe, that they have all well organized Agricultural Societies, which have been some time in operation, and are marching forward in the work of improvement." For ourselves, we much doubt whether any people on earth better understand the philosophy of Agriculture than the leading men of the very region described. The misfortune is, want of—*perseverance* in resolution to bring about an amendment in State policy and individual habits and practices.

THE CAROLINIAN is another staunch advocate of the good cause—both discreet and vigilant, as the following may show:

Fine Flocks of Sheep in the Vicinity of Columbia, South Carolina.—The practical Agriculturist and genuine lover of rural affairs would be both gratified and amply repaid by visiting the magnificent flocks of Sheep belonging to Col. Wade Hampton and Mr B. F Taylor, in the neighborhood of this city. Those who wish to be convinced of the fact that we can successfully raise fine sheep in our Southern climate, should go by all means. Examples like these are worth more than a heaped up mountain of

arguments, theoretically prepared by those who take interest in advocating such things through the medium of the Agricultural journals. The flock of Col. Hampton is superior to any other we have ever seen in any part of the United States. They are pure blooded Leicesters, and Bakewell himself were he living, would be proud to own them. They cannot have lost much, if any thing, of their characteristic superiority, if we judge by some of his animals which have matured. Mr. Taylor's flock is chiefly Merino with a dash of the blood of the African or Broad-tailed Sheep, and they have shown themselves to be extremely fine and prolific. He recently showed us the fleece of a buck lamb 14 months old, which weighed 10¼ pounds. Dr. Parker, the Superintendent of the Lunatic Asylum in this city, has just shorn a pair of last spring's Leicester lambs, about 14 months old, bred by Col. Hampton, and the weight of the fleece from the buck lamb was 13¼ pounds, whilst that from the ewe lamb weighed 11¼ pounds.

Col. Hampton has shorn all his lambs of the present season, and we will make the wool growers of the North open their eyes when we state that the average weight of the fleece of about sixty head, was four pounds each. He has done this in order to relieve them from the oppressive heat of summer.

On visiting his flock a few days since, we found them in fine condition, without the least appearance of disease of any kind amongst them, and what is remarkable, they have kept in good order on very short pasturage, which is one of the very best evidences we can give of the thrift of this remarkable breed of sheep.

With such flattering results before us, why should we despair of making a great portion of our State profitable in this branch of rural enterprise. We have already adverted to the superior advantages of our mountain regions as sheep walks, and we shall on some other occasion gather information and give our own views upon the propriety of introducing good breeds of Sheep in the middle sections and lower country of South Carolina. That the whole sandhill region bordering on our extensive swamps is eminently adapted to this, has been fully proven by the success of the flocks above mentioned.

PRICES CURRENT.

[Corrected, July 23, for the Monthly Journal of Agriculture.]

ASHES—Pots, 1st sort	℔ 100 lb.	3 81½	@— —
Pearls, 1st sort		4 12½	@ 4 18¾
BEESWAX—American Yellow		— 29½	@— 30
CANDLES—Mould, Tallow	℔ lb.	— 9	@— 11
Sperm, Eastern and City		— 27	@— 29
COTTON—From		— 6	@— 10
COTTON BAGGING—American		— 13	@— —
CORDAGE—American	@ lb.	— 11	@— 12
DOMESTIC GOODS—Shirtings	℔ y.	— 5	@— 11
Sheetings		— 6½	@— 12½
FEATHERS—American, live		— 26	@— 30
FLAX—American		— 6½	@— 7½
FLOUR & MEAL—Genesee	℔ bbl.	4 37½	@— —
Troy		— —	@— —
Michigan		4 31½	@— —
Ohio, flat hoop		4 31½	@— —
Ohio, Haywood & Venice		5 25	@ 5 37½
Ohio, via New-Orleans		4 12½	@ 4 25
Pennsylvania		4 75	@— —
Brandywine		4 75	@— —
Georgetown		4 75	@— —
Baltimore City Mills		4 62½	@ 4 75
Richmond City Mills		— —	@— —
Richmond Country		4 62½	@ 4 75
Alexandria, Petersburg, &c.		4 62½	@ 4 75
Rye Flour		2 87½	@ 3 25
Corn Meal, Jersey and Brand		2 31½	@ 2 56¼
Corn Meal, Brandywine	hhd,	11 75	@— —
GRAIN—Wheat, Western	℔ bush.	— 95	@ 1 05
Wheat, Southern		1 00	@ 1 06
Rye, Northern		— 65	@— —
Corn, Jersey and North	(meas.)	— 50	@— 53
Corn Southern	(measure)	— 50	@— —
Corn, Southern	(weight)	— 49	@— 50
Barley, Western		— —	@— —
Oats, Northern		— 42	@— 44
Oats Southern		— —	@— —
HAY—North River	bales	— 50	@— 75
HEMP—American, dew rotted	ton	85 —	@100 —
" " water rotted		120 —	@182 50
HOPS—1st sort, 1845		— 12½	@— 15
IRON—American Pig, No. 1		35 —	@37 50
" Common		32 50	@35 —
LIME—Thomaston	℔ bbl,	— —	@— 75
LUMBER—Boards, N.R.	℔M. ft. clr.	30 —	@35 —
Boards, Eastern Pine		10 —	@11 —
Boards, Albany Pine	℔pce.	— 7	@— 17
Plank, Georgia Pine	℔M. ft.	33 —	@35 —
Heading, White Oak	℔M.	— —	@45 —
Staves, White Oak, pipe		45 —	@— —
Staves, White Oak, hhd		37 —	@— —
Staves, White Oak, bbl		28 —	@— —
Staves, Red Oak, hhd		27 —	@28 —
Hoops		25 —	@30 —
Scantling, Pine, Eastern		14 —	@16 —
Scantling, Oak		30 —	@35 —
Timber, Oak	℔ cubic foot	— 25	@— 37
Timber, White Pine		— 18	@— 25
Timber, Georgia Yellow Pine		— 35	@— 40
Shingles, 18 in	℔ bunch	1 50	@ 2 —
Shingles, Cedar, 3 feet, 1st quality		22 —	@24 —
Shingles, Cedar, 3 feet, 2d quality		20 —	@22 —
Shingles, Cedar, 2 feet, 1st quality		— —	@17 50
Shingles, Cedar, 2 feet, 2d quality		15 —	@16 —
Shingles, Cypress, 2 feet		11 —	@13 —
Shingles, Company		— —	@30 —
MUSTARD—American		— 16	@— 31
NAILS—Wrought, 6d to 20d		— 10	@— 12½
Cut, 4d to 40d		— 4½	@— 4¾
PLASTER PARIS—℔ ton		2 50	@ 2 62½
PROVISIONS—Beef, M., new	℔ bbl.	8 75	@ 9 25
Beef, Prime,		5 75	@ 6 —
Pork, Mess, Ohio, old and new		12 62½	@13 12½
Pork, Prime, Ohio, old and new		9 75	@10 62½
Lard, Ohio	℔ lb.	— 7½	@— 8¾
Hams, Pickled		— 6½	@— 7
Shoulders, Pickled		— 4½	@— 5
Sides, Pickled		— 6	@— 6½
Beef Hams, in Pickle	℔ bbl.	12 —	@12 50
Beef, Smoked	℔ lb.	— 8	@— 8½
Butter, Orange County		— 15	@— 18
Butter, Western Dairy		— 11	@— 13
Butter, ordinary		— 10	@— —
Cheese, in casks and boxes		— 5½	@— 6½
SEEDS—Clover	℔ lb.	— 6½	@— 7½
Timothy	℔ tierce	12 —	@14 —
Flax, Rough		8 50	@ 8 75
Flax, Clean		— —	@— —
SOAP—N. York, Brown	℔ lb.	— 3½	@— 5½
TALLOW—American, Rendered		— 7	@— 7½
TOBACCO—Virginia	@ lb.	— 2½	@— 5½
North Carolina		— 2½	@— 5
Kentucky and Missouri		— 2½	@— 5½
WOOL—Ame. Saxony, Fleece	℔ lb.	— 36	@— 38
American, Full Blood Merino		— 32	@— 34
American ½ and ¾ Merino		— 27	&— 28
American Native and ¼ Merino		— 24	@— 26
Superfine, Pulled		— 31	@32 —

LITH. BY G. & W. ENDICOTT, N. YORK.

BECAN HERO,

SHORT HORN BULL, PROPERTY OF SIR CHARLES TEMPEST, BART,

Winner of the first Prize of $500 at the Meeting of the Highland society of Scotland

New York, Published by Gretley & Mc Elrath for the Farmers Library J. S. SKINNER *Edit*